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1917/18

Because of war conditions, the date for the opening of the college year has been changed to October 10, and the calendar dates appearing in this bulletin will be modified accordingly.

UNIVERSITY CALENDAR

1917-1918

1917			
September	12	Wednesday	Registration closes for all students
September	12-19	Week	Fees payable for all students
September	18-25	Week	Examinations for removal of conditions (except for Colleges of Agriculture and Forestry), and entrance examinations
September	26	Wednesday	First semester begins
October	1	Monday	Agricultural College, farm experience examinations
October	1	Monday	First semester evening classes begin
October	1	Monday	School of Agriculture, first term begins
October	18	Thursday	Senate meeting, 4:00 p.m.
November	5	Monday	Dairy School opens
November	21	Wednesday	Medical School second quarter begins
November	28	Wednesday	Thanksgiving recess begins 9:00 p.m.
December	1	Saturday	Dairy School closes
December	3	Monday	Thanksgiving recess ends 8:00 a.m.
December	3-8	Week	Second semester condition examinations, Colleges of Agriculture and Forestry
December	3-8	Week	Short course for ice-cream makers
December	20	Thursday	Senate meeting, 4:00 p.m.
December	21	Friday	School of Agriculture, first term closes
December	21	Friday	Christmas vacation begins 9:00 p.m.
1918			
December	31	} Week	Farmers' and Home Makers' Week
January	5		Short Course
January	2	Wednesday	Christmas vacation ends 8:00 a.m.
January	2	Wednesday	School of Embalming begins, eight weeks' session
January	8	Tuesday	School of Agriculture, second term begins
January	23	Wednesday	Second semester registration closes
January	25	Friday	First semester evening classes close
January	28	Monday	Final examinations begin
January	30	Wednesday	Payment of fees for second semester closes
February	4	Monday	Second semester evening classes begin

THE MEDICAL SCHOOL

February	4-9	Week	Merchants' Short Course
February	6	Wednesday	Merchants' Short Course (three weeks) begins
February	11	Monday	Second semester begins
February	12	Tuesday	Lincoln's Birthday; a holiday
February	21	Thursday	Senate meeting, 4:00 p.m.
February	22	Friday	Washington's Birthday; a holiday
March	2	Saturday	Merchants' Short Course (three weeks) closes
March	27	Wednesday	School of Agriculture closes
March	28	Thursday	Easter recess begins 9:00 p.m.
April	1-6	Week	Boys' and Girls' Week
April	3	Wednesday	Easter recess ends 8:00 a.m.
April	10	Wednesday	Medical School fourth quarter begins
April	8-13	Week	Condition examinations in certain colleges
April	30	Tuesday	Traction Engineering Short Course begins
May	16	Thursday	Senate meeting, 4:00 p.m.
May	25	Friday	Second semester evening classes close
May	30	Thursday	Memorial Day; a holiday
May	31	Friday	Traction Engineering Short Course closes
June	1	Saturday	Final examinations begin 2:00 p.m.
June	8	Saturday	Second semester closes
June	9	Sunday	Baccalaureate service
June	10	Monday	Senior Class Day exercises
June	12	Wednesday	Alumni Day
June	13	Thursday	Forty-sixth Annual Commencement
June	14	Friday	Summer vacation begins
June	17	Monday	Summer Session begins

The University year for 1918-19 will begin Tuesday, September 17. Classes will begin September 25.

THE MEDICAL SCHOOL

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JULIUS PARKER SEDGWICK, B.S., M.D., Chief of the Department of Pediatrics
EMIL S. GEIST, M.D., Member-Elect, Representing the Faculty
FREDERICK H. SCOTT, Ph.D., M.B., D.Sc., Member-Elect, Representing the Faculty

FACULTY

- †GEORGE EDGAR VINCENT, Ph.D., LL.D., President 1005 5th St. S. E.
‡MARION LEROY BURTON, D.D., Ph.D., LL.D., President 1005 5th St. S. E.
CYRUS NORTHROP, LL.D., President, Emeritus 519 10th Ave. S. E.
AMOS W. ABBOTT, M.D., Emeritus Professor of Gynecology 1717 Marquette Ave.
*EVERTON J. ABBOTT, B.A., M.D., Emeritus Professor of Clinical Medicine 425 Dayton Ave., St. Paul
JOHN W. BELL, M.D., Emeritus Professor of Clinical Medicine and Physical Diagnosis 5127 Lake Harriet Blvd.

* Deceased.

† Term of office expires June 30, 1917.

‡ Term of office begins July 1, 1917.

- C. EUGENE RIGGS, M.A., M.D., Emeritus Professor of Mental and Nervous Diseases 10 Crocus Hill, St. Paul
- THOMAS S. ROBERTS, M.D., Emeritus Professor of Pediatrics 2303 Pleasant Ave.
- JAMES T. CHRISTISON, M.D., Emeritus Professor of Pediatrics 535 Lowry Bldg., St. Paul
-
- FRED L. ADAIR, B.S., M.D., Associate Professor of Obstetrics and Gynecology 820 Donaldson Bldg.
- LOUIS B. BALDWIN, M.D., Superintendent of University Hospitals 509 E. River Road
- MOSES BARRON, B.S., M.D., Assistant Professor of Pathology 763 Holly Ave., St. Paul
- RICHARD OLDING BEARD, M.D., Assistant Dean and Secretary and Associate Professor of Physiology University of Minnesota
- ELEXIOUS T. BELL, B.S., M.D., Associate Professor of Pathology 521 Sixth St. S. E.
- FRANK S. BISSELL, M.D., Assistant Professor of Roentgenology 4412 Lake Harriet Blvd.
- FRANCIS G. BLAKE, A.B., M.D., Assistant Professor of Medicine
- EDGAR D. BROWN, Ph.D., M.D., Associate Professor of Pharmacology 3525 3d Ave. S.
- FRANK E. BURCH, M.D., Assistant Professor of Ophthalmology and Otolaryngology 935 Lowry Bldg., St. Paul
- ALEXANDER R. COLVIN, M.D., Assistant Professor of Surgery 630 Lowry Bldg., St. Paul
- HENRY WIREMAN COOK, B.A., M.D., Lecturer on Life Insurance Auditorium Bldg.
- J. FRANK CORBETT, M.D., Associate Professor of Experimental Surgery 4401 E. Lake Harriet Blvd.
- CHARLES A. ERDMANN, M.D., Associate Professor of Applied Anatomy 612 9th Ave. S. E.
- GEORGE B. FRANKFORTER, Ph.D., Dean of the School of Chemistry 525 East River Road
- EMIL S. GEIST, M.D., Assistant Professor of Orthopedic Surgery 614 Syndicate Bldg.
- JAMES S. GILFILLAN, M.D., Associate Professor of Medicine 942 Lowry Bldg., St. Paul
- ARTHUR J. GILLETTE, M.D., Professor of Orthopedic Surgery, in Charge of Division Seven Corners, St. Paul
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- THOMAS B. HARTZELL, D.M.D., M.D., Research Professor in Mouth Infections 716 Donaldson Bldg.
- ARTHUR D. HIRSCHFELDER, B.S., M.D., Professor of Pharmacology and Director of the Department 2364 Lake of Isles Blvd.

- CLARENCE MARTIN JACKSON, M.S., M.D., Professor of Anatomy and Director of the Department 436 Harvard St. S. E.
- JOHN B. JOHNSTON, Ph.D., Dean of the College of Science, Literature, and the Arts, and Professor of Comparative Neurology 1115 5th St. S. E.
- WINFORD P. LARSON, M.D., Associate Professor of Bacteriology 614 9th Ave. S. E.
- ARTHUR A. LAW, M.D., Associate Professor of Surgery 420 Syndicate Bldg.
- THOMAS G. LEE, B.S., M.D., Professor of Comparative Anatomy 509 E. River Road
- JENNINGS C. LITZENBERG, B.S., M.D., Professor of Obstetrics and Gynecology and Chief of the Department 910 Donaldson Bldg.
- ELIAS P. LYON, Ph.D., M.D., Dean, Professor of Physiology and Director of the Department 421 Union St. S. E.
- JOHN F. McCLENDON, Ph.D., Assistant Professor of Physiology 715 University Ave. S. E.
- ARCHIBALD MACLAREN, B.S., M.D., Associate Professor of Surgery 914 Lowry Bldg., St. Paul
- JOHN S. MACNIE, B.A., M.D., Assistant Professor of Ophthalmology and Oto-Laryngology 506 Donaldson Bldg.
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- WALTER R. RAMSEY, M.D., Associate Professor of Pediatrics 942 Lowry Bldg., St. Paul
- *SOREN P. REES, B.S., M.D., Assistant Professor of Medicine 1964 Penn Ave. S.
- HARRY P. RITCHIE, Ph.B., M.D., Assistant Professor of Surgery 914 Lowry Bldg., St. Paul
- HAROLD E. ROBERTSON, B.A., M.D., Professor of Pathology and Director of Department of Pathology, Bacteriology, and Public Health 507 Essex St. S. E.
- JOHN T. ROGERS, M.D., Associate Professor of Surgery 342 Lowry Bldg., St. Paul

* Resigned.

- JOHN L. ROTHROCK, M.A., M.D., Associate Professor of Obstetrics and Gynecology 514 Lowry Bldg., St. Paul
- LEONARD G. ROWNTREE, M.D., Professor of Medicine and Chief of the Department 1917 Fremont Ave. S.
- RICHARD E. SCAMMON, Ph.D., Professor of Anatomy 521 6th St. S. E.
- FREDERICK H. SCOTT, Ph.D., M.B., D.Sc., Associate Professor of Physiology 1307 6th St. S. E.
- FREDERIC W. SCHLUTZ, B.A., M.D., Assistant Professor of Pediatrics 820 Donaldson Bldg.
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- SAMUEL E. SWEITZER, M.D., Assistant Professor, in charge of Division of Dermatology and Syphilis 625 Syndicate Bldg.
- FRANK C. TODD, M.D., Professor of Ophthalmology and Oto-Laryngology, and Chief of the Department 506 Donaldson Bldg.
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- S. MARX WHITE, B.S., M.D., Professor of Medicine 910 Donaldson Bldg.
- M. RUSSELL WILCOX, M.D., Assistant Professor of Physiology 802 Donaldson Bldg.
- FRANKLIN R. WRIGHT, M.D., Assistant Professor, in charge of Division of Urology 707 Donaldson Bldg.
- FREDERICK J. WULLING, Ph.D., LL.M., Dean of the College of Pharmacy 3305 2d Ave. S.

-
- JOHN S. ABBOTT, B.A., M.D., Instructor in Surgery 914 Lowry Bldg., St. Paul
- JOHN M. ARMSTRONG, M.D., Instructor in Dermatology and Syphilis 1040 Lowry Bldg., St. Paul
- J. FOWLER AVERY, M.D., Instructor in Medicine 907 Donaldson Bldg.
- ANNE G. BENTON, B.A., Instructor in Bacteriology and Pathology 2024 Queen Ave. S.
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- HOWARD S. CLARK, B.S., M.D., Instructor in Ophthalmology and Oto-Laryngology 616 Syndicate Bldg.
- WALLACE COLE, M.D., Instructor in Orthopedic Surgery 1004 Lowry Bldg., St. Paul
- WILLIAM H. CONDIT, B.S., M.D., Instructor in Obstetrics 2205 Kenwood Pkwy.

- PAUL B. COOK, M.D., Instructor in Dermatology and Syphilis
710 Lowry Bldg., St. Paul
- BRONSON CROTHERS, B.A., M.D., Instructor in Pediatrics
1004 Lowry Bldg., St. Paul
- CHARLES R. DRAKE, M.D., Instructor in Medicine
606 Physicians' and Surgeons' Bldg.
- EDWIN L. GARDNER, B.S., M.D., Instructor in Medicine
1011 E. River Road
- ALEXANDER R. HALL, M.D., C.M., Instructor in Medicine
535 Lowry Bldg., St. Paul
- *EARLE R. HARE, B.A., M.D., Instructor in Surgery 623 Syndicate Bldg.
- ARTHUR T. HENRICI, M.D., Instructor in Pathology and Bacteriology and
Research Assistant in Mouth Infections 939 14th Ave. S. E.
- EDGAR J. HUENEKENS, B.A., M.D., Instructor in Pediatrics
803 Physicians' and Surgeons' Bldg.
- HARRY G. IRVINE, M.D., Instructor in Dermatology and Syphilis
601 Syndicate Bldg.
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- FRANCIS B. KINGSBURY, Ph.D., Instructor in Physiologic Chemistry
209 State St. S. E.
- RAE T. LAVAKE, B.A., M.D., Instructor in Obstetrics and Gynecology
910 Donaldson Bldg.
- WILLIAM W. LEWIS, M.D., Instructor in Ophthalmology and Oto-Laryng-
ology 836 Lowry Bldg., St. Paul
- CLARENCE O. MALAND, B.A., M.D., Instructor in Obstetrics and Gynecology
300 Physicians' and Surgeons' Bldg.
- JAY A. MYERS, Ph.D., Instructor in Anatomy 4025 12th Ave. S.
- GEORGE M. OLSON, M.D., Instructor in Dermatology and Syphilis
636 Syndicate Bldg.
- HAROLD PEDERSON, B.A., M.D., Instructor in Medicine
314 Syndicate Bldg.
- CHAUNCEY J. V. PETTIBONE, Ph.D., Instructor in Physiologic Chemistry
611 Delaware St. S. E.
- FREDERICK H. POPPE, B.A., M.D., Instructor in Surgery
820 Donaldson Bldg.
- FRED J. PRATT, M.D., Instructor in Ophthalmology and Oto-Laryngology
328 E. Hennepin Ave.
- ANDREW T. RASMUSSEN, B.A., Instructor in Neurology 979 14th Ave. S. E.
- CHARLES A. REED, B.S., M.D., Instructor in Orthopedic Surgery
420 Syndicate Bldg.
- ERNEST T. F. RICHARDS, M.D., C.M., Instructor in Medicine
741 Lowry Bldg., St. Paul
- ROBERT I. RIZER, M.D., Instructor in Medicine 219 Meyers' Arcade
- FREDERICK C. RODDA, M.D., Instructor in Pediatrics 614 Syndicate Bldg.
- JOHN P. SCHNEIDER, M.D., Instructor in Medicine 414 Syndicate Bldg.
- JALMAR H. SIMONS, B.S., M.D., Instructor in Obstetrics
1020 Donaldson Bldg.

- CHESTER A. STEWART, M.A., Instructor in Anatomy 1819 4th St. S. E.
 MARION A. TEBBETS, B.A., Director of the Department of Social Service
 Glen Lake, Minn.
 MARGARET WARWICK, B.S., M.D., Instructor in Pathology and Bacteriol-
 ogy 1516 7th St. S. E.
 FREDERICK W. WITTICH, B.A., M.D., Instructor in Medicine
 704 Pillsbury Bldg.
 CHARLES B. WRIGHT, A.B., M.D., Instructor in Medicine
 907 Donaldson Bldg.
 HARRY B. ZIMMERMAN, M.D., Instructor in Surgery
 342 Lowry Bldg., St. Paul

Members of the faculties of other schools giving instruction to medical students:

- IRA HARRIS DERBY, Ph.D., Assistant Professor of Chemistry
 WILLIAM H. HUNTER, Ph.D., Assistant Professor of Chemistry

TEACHING ASSISTANTS

- ERRETT C. ALBRITTON, B.S., Assistant in Anatomy 122 21st Ave. S.
 WILLIAM D. BEADIE, M.D., C.M., Assistant in Pediatrics
 949 Lowry Bldg., St. Paul
 ARCHIBALD H. BEARD, B.A., M.D., Resident Physician and Assistant in
 Medicine University Hospital
 J. WARREN BELL, M.D., Assistant in Medicine 1001 E. River Road
 TOBIAS L. BIRNBERG, M.D., Assistant in Pediatrics
 1035 Lowry Bldg., St. Paul
 LOUISA M. BOUTELLE, B.A., M.D., Assistant in Medicine 4120 Elliott Ave.
 ERWIN W. BRUSS, D.D.S., Assistant in Dental Diseases
 WALTER E. CAMP, B.A., M.D., Assistant in Ophthalmology and Oto-
 Laryngology 910 Donaldson Bldg.
 HAROLD S. DIEHL, A.B., Assistant in Pathology and Bacteriology
 429 Union St. S. E.
 EDWARD J. ENGBERG, M.D., Assistant in Nervous and Mental Diseases
 1044 Lowry Bldg., St. Paul
 WALTER A. FANSLER, A.M., M.D., Assistant in Medicine 100 Andrus Bldg.
 CHARLES W. FOGARTY, M.D., Assistant in Ophthalmology and Oto-Laryn-
 gology 314 Lowry Bldg., St. Paul
 PAUL W. GIESSLER, B.S., M.D., Assistant in Surgery
 701 Physicians' and Surgeons' Bldg.
 EUGENE K. GREEN, M.D., Assistant in Surgery
 808 Physicians' and Surgeons' Bldg.
 WILLIAM A. GREY, D.D.S., Research Assistant in Mouth Infections
 923 Lowry Bldg., St. Paul
 CHARLES A. HALLBERG, M.D., Assistant in Surgery 204 Donaldson Bldg.
 ARNOLD L. HAMEL, A.B., M.D., Assistant in Medicine
 Lake and Bloomington Aves.
 JAMES F. HAMMOND, M.D., C.M., Assistant in Obstetrics
 334 Lowry Bldg., St. Paul

- OLGA S. HANSEN, B.S., M.D., Assistant in Medicine
2248 Carter Ave., St. Paul
- HUGO J. HARTIG, B.S., M.D., Assistant in Surgery 701 20th Ave. N.
- JOSEPH A. HEDDING, M.D., Assistant in Pediatrics
500 Physicians' and Surgeons' Bldg.
- CLARENCE HERMANN, D.D.S., Assistant in Dental Diseases
- JOHN P. HIEBERT, M.D., Assistant in Surgery 420 Syndicate Bldg.
- KANO IKEDA, M.D., Assistant in Bacteriology St. Barnabas Hospital
- BRUCE W. JARVIS, B.S., M.D., Assistant in Obstetrics and Gynecology
207 Moore Bldg., St. Paul
- E. MENDELSSOHN JONES, M.D., Assistant in Obstetrics and Gynecology
544 Lowry Bldg.
- JOHN A. KITTELSON, B.S., Assistant in Anatomy 1609 7th St. S. E.
- RALPH T. KNIGHT, A.B., M.D., Assistant in Pediatrics
623 Syndicate Bldg.
- WALTER J. KREMER, M.D., Assistant in Urology 625 Plymouth Ave. N.
- JOHN W. LEE, M.D., M.C., Assistant in Ophthalmology and Oto-Laryn-
gology 513 Syndicate Bldg.
- ADOLPH E. LOBERG, M.D., Assistant in Mental and Nervous Diseases
1909 Washington Ave. S.
- EARL A. LOOMIS, B.A., M.D., Assistant in Ophthalmology and Oto-Laryn-
gology 203 Donaldson Bldg.
- HENRY A. LYSNE, B.S., M.D., Assistant in Pediatrics 700 20th Ave. N.
- JOHN C. MCKINLEY, B.S., Assistant in Anatomy 2423 Irving Ave. S.
- FRANK S. MCKINNEY, A.B., M.D., Assistant in Medicine
3006 Nicollet Ave.
- THOMAS J. MALONEY, M.D., Assistant in Ophthalmology and Oto-Laryn-
gology 436 Lowry Bldg., St. Paul
- ERNEST S. MARIETTE, B.S., M.D., Assistant in Medicine
Glen Lake Sanatorium
- JOSEPH C. MICHAELS, B.S., M.D., Assistant in Nervous and Mental Dis-
eases 1019 Lowry Bldg., St. Paul
- FREDERICK P. MOERSCH, B.S., M.D., Assistant in Nervous and Mental
Diseases 406 Physicians' and Surgeons' Bldg.
- HARRY P. NORDLEY, M.D., Assistant in Medicine 1501 Washington Ave. S.
- EDGAR H. NORRIS, B.S., Assistant in Anatomy 5031 Colfax Ave. S.
- JAMES M. NORTHINGTON, M.D., Assistant in Medicine Campus Club
- GUSTAV A. RENZ, M.D., Assistant in Obstetrics and Gynecology
Lowry Bldg., St. Paul
- WILLMAR C. RUTHERFORD, M.D., Assistant in Obstetrics and Gynecology
618 Lowry Bldg., St. Paul
- JOHN H. SCHROEDER, B.S., M.D., Assistant in Dermatology
1226 Marquette Ave.
- EDWARD P. SLATER, B.S., Assistant in Physiology 226 Harvard St. S. E.
- CHARLES E. SMITH, Jr., M.D., Assistant in Pediatrics
741 Lowry Bldg., St. Paul
- MARGARET I. SMITH, M.D., Assistant in Ophthalmology and Oto-Laryn-
gology 1940 Emerson Ave. S.

- HOMER R. SMITH, M.D., Assistant in Medicine 3401 5th Ave. S.
 FREDERICK J. SOUBA, B.S., M.D., Assistant in Obstetrics and Gynecology
 1007 Donaldson Bldg.
 COURT ROGER STANLEY, M.D., Assistant in Medicine 1301 Penn Ave. S.
 HENRY C. STUHR, M.D., Assistant in Surgery 628 Syndicate Bldg.
 PERCY A. WARD, M.D., Assistant in Pathology and Bacteriology
 429 Union St. S. E.
 H. JOURNEY WELLES, M.D., Assistant in Ophthalmology and Oto-Laryn-
 gology 307 Masonic Temple
 ANTON G. WETHALL, B.S., M.D., Assistant in Urology 325 Cedar Ave.
 OTTO L. WINTER, A.B., M.D., Assistant in Medicine
 Seven Corners, St. Paul
 FLORIEN VAUGHN, B.A., Assistant in Anatomy 421 Oak St. S. E.
 DANIEL E. ZISKIN, D.D.S., Assistant in Dental Diseases

TEACHING FELLOWS

- LEE W. BARRY, M.D., in Department of Obstetrics and Gynecology
 DONALD F. CAMERON, M.A., M.D., in Department of Surgery
 CHARLES E. CONNERS, M.A., M.D., in Department of Ophthalmology and
 Oto-Laryngology
 SAMUEL T. FORSYTHE, B.A., M.D., in Department of Ophthalmology and
 Oto-Laryngology
 FLOYD GRAVE, B.S., M.D., in Department of Medicine
 GOLDER L. MCWHORTER, B.S., M.D., in Department of Surgery
 RALPH EDWIN MORRIS, M.S., M.D., in Department of Medicine
 CHARLES E. NIXON, A.B., M.D., in Nervous and Mental Diseases
 NABOTH O. PEARCE, M.D., in Department of Pediatrics
 ROOD TAYLOR, M.D., in Department of Pediatrics
 HENRY W. WOLTMANN, B.S., M.D., in Division of Mental and Nervous
 Diseases

GRADUATE SCHOLARS

- HENRY J. FRIESEN, M.D., in Ophthalmology and Oto-Laryngology
 ERLING W. HANSEN, B.S., M.D., in Otology
 ARTHUR E. MARK, B.S., M.D., in Ophthalmology and Oto-Laryngology
 MILLARD F. SMITH, B.S., in Otology

GENERAL INFORMATION

The thirtieth annual course of study in the Medical School begins Tuesday, September 18, 1917, and covers a period of nine months. The summer session opens June 18, 1917.

REQUIREMENTS FOR ADMISSION TO THE MEDICAL SCHOOL

(a) Two years of high school Latin, as part of the high school course required for entrance to the College of Science, Literature, and the Arts.*

(b) At least two years, or sixty credits, of prescribed and elective study in the College of Science, Literature, and the Arts of this University or of any other approved institution. The prescribed academic studies preliminary to medicine are: rhetoric, six credits; physics, eight credits; general chemistry and qualitative analysis, or these subjects combined with organic chemistry, twelve credits; zoology, six credits; and a reading knowledge of German.

This two or more years of collegiate study leads, upon the satisfactory completion of one or two years of medical study, to the baccalaureate degree in science or in arts. Students holding the bachelor's degree of any recognized college may submit credentials of practical equivalence in cultural studies, provided an adequate knowledge of biology, chemistry, and physics has been attained, and a reading knowledge of German is demonstrated.

With the year 1918, organic chemistry, as well as general chemistry and qualitative analysis, will become a pre-medical requirement and will not be included in the medical curriculum. It is recommended as a preliminary study at the present time, but provision will be made, until that date, for its inclusion in the schedule of the third year.

REGISTRATION

Registration is conducted under general University rules, in the office of the Registrar. Registration is reported to the office of the Dean of the Medical School. Students will interview the Students' Work Committee for classification and arrangement of courses. Students will not be permitted to register later than the tenth day from the opening of the semester, unless exceptional causes of delay are presented and are accepted by the Students' Work Committee.

On account of the present limited capacity of the Medical School, the registration of incoming (third year) classes has been limited to eighty.

* Candidates who offer a reading knowledge of both German and French may be excused, at the discretion of the Students' Work Committee, from one or more years of Latin.

All applicants for admission will fill out and submit to the Dean's office an application form. These applications should be entered so soon as the candidate's entrance requirements are completed. They will not be received later than August 1, 1917. If preparatory work has been done elsewhere than at the University of Minnesota, application must be accompanied by certified credentials of high school and college courses.

The Students' Work Committee will meet to consider applicants for admission at 9 a.m. on June 5, July 2, and August 1, 1917. A personal interview is required. Recommendations as to personal fitness, preparation, etc., must be submitted, with credentials.

Candidates will be selected with reference (a) to their full compliance with existing requirements; (b) to the quality of their preparatory work; (c) to their general knowledge; and (d) to their personal fitness. They will be submitted to competitive examination to establish their fitness and to determine their comparative merits. Such examinations will be held upon the dates given above. They will include tests of mental ability and general information. A physical examination is required.

Existing published requirements for admission to the Medical School will be respected. Holders of the degree of B.A. or B.S. who have covered the required subjects, and those who have successfully completed two or three years of collegiate work, including full credits and required subjects, will be entitled, other things being equal, to first consideration for existing vacancies at the date of their application.

No applicant carrying deficiencies in more than six collegiate credits, (including a reading knowledge of German, and the required two years of high-school Latin), will be considered. Such reading knowledge of German will be tested upon either of the above examination dates.

All other qualifications being equal, residents of Minnesota will be given prior opportunity in any vacancies existing at the date of their application.

If an entrance condition is allowed, it must be removed, invariably, before the opening of the succeeding school year.

FEES

The annual tuition fee in the Medical School is \$150, payable in two installments, at the opening of the first and second semesters. No tuition fee is charged for the final hospital or advanced laboratory year, which is now requisite to the degree.

A deposit of \$10 in the first year, and of \$5 in succeeding years, is required as a caution fee. This fee covers the cost of unnecessary damage to school buildings, of breakage and loss of laboratory apparatus and material, penalties for late registration or late payment of fees, fees for condition examinations, and rentals of post-office box and lockers. Any balance remaining from this deposit will be returned to the student at the close of each year.

Students taking less than the regular course may arrange their fees upon a scale of \$3 for each semester-hour's work.

Repetition of work in course demands the repetitional payment of fees.

A fee of \$1 is required for condition examinations; and a fee of \$5 for special examinations.

A fee of \$1 is required for attendance of students upon the clinical service of the City and County Hospital of St. Paul. It is payable to the Hospital.

MICROSCOPES

Students will provide themselves, by purchase or rental, with a microscope of approved quality and equipment. They may arrange with the Assistant Dean for purchase of microscopes, through the University, upon cash payment or installment plan. Microscopes of suitable type range in cost from \$50 upwards.

COMBINED COURSES IN ARTS AND MEDICINE

Students who are candidates for the degree of Bachelor of Arts, who have successfully completed three years, or 90 credits, of work and have won the required number of honor points in the College of Science, Literature, and the Arts, may elect their fourth year in the Medical School and secure the remaining 30 credits and the remaining honor points required for the baccalaureate degree, in that school.

Similarly, students who have completed, with the required number of honor points, the work of the first two years, or 60 credits, in the College of Science, Literature, and the Arts, may enter the Medical School and upon the successful conclusion of two years' work, with the required sixty honor points, will receive the degree of Bachelor of Science.

Students who have not received the B.A. or B.S. degree will be ineligible to registration in the fifth year of the combined course.

It will be understood that in either of these combined courses the required subjects, viz.: rhetoric, chemistry, zoology, physics, and a reading knowledge of German, must be included.

THE CURRICULUM

Within the four years of study in the Medical School, students cover a total of 4,200 hours of required and elective work. These hours are distributed as follows:

Subject	Hours	Subject	Hours
Anatomy	688	Medicine, including Medical Juris-	
Physiology	416	prudence	681
Physical Chemistry.....	96	Surgery	547
or		Obstetrics	206
Organic Chemistry.....	160	Pediatrics	102
Pathology	392	Ophthalmology and Oto-Laryn-	
Bacteriology	168	gology	88
Pharmacology	160	Electives	592
Hygiene	32		

ELECTIVE STUDIES

Elective courses are offered in the fourth, fifth, and sixth years. These are listed under Departmental Statements.

Certain approved courses in animal biology, chemistry, and other subjects taught in the University, outside the Medical School, may be taken as electives by medical students. A list of these courses is given in the quarterly programs.

The general arrangement of studies is planned for the average student of medicine. The order of studies is not absolutely fixed. As wide a range of individual freedom is permitted as may prove consistent with systematic education. The Committee on Students' Work has authority, within due bounds of sequence of subjects, to adjust a student's program to his particular preparation, needs, and abilities.

MIGRATORY STUDENTS

Students migrating from recognized medical schools will present to the Registrar their official credentials of admission requirements, which must be equivalent to those of this School. They will submit to the Students' Work Committee time and subject credits in medicine. They will present to the head of each department, in which they seek exemption or advanced standing, records of successful examinations. These may be accepted as of full value or supplemented by review examination, at the discretion of the department. Subject credit, but not time credit, may be given for work done other than in a medical school. Special work will be arranged for students taking such subject credits to fill the full period required by law in medical study.

No advanced standing entitles the student to take two years of any graded study coincidentally.

CLINICAL SERVICE

Attendance upon clinics is required and will be recorded.

Seniors are assigned to clinical clerkships in the University Hospital. As clinical clerks they are under the supervision of senior interns or Teaching Fellows, who will assign them to duty.

For this service the hospital is open from 9:30 a.m. to 12 m. and from 1 p.m. to 4:30 p.m. Clinical clerks will record physical examinations, make and record laboratory investigations, and will attend hospital rounds and general clinics. Patients will be examined by clinical clerks only at the direction of the attending clinician.

EXAMINATIONS

The standing of students is determined by recitations, oral or written examinations, and review of laboratory or clinical note books. Examina-

tions are usually held at the end of each semester upon the courses closed within that period. Final standings are determined at the close of each semester in conference of the heads of departments with the Students' Work Committee. Reports of such standings are filed in and are announced by the Registrar's office.

A uniform marking system has been adopted for the whole University. Four passing grades, indicated by the symbols *A*, *B*, *C*, and *D*, represent differing degrees of merit. The symbol *E* represents a condition, which may be removed by examination and by such supplementary work as the department imposing it may require. *F* stands for a failure and calls for a repetition of the work in class. *I* stands for incomplete and grants the student further time for the completion of the required work.

CONDITIONS

It is incumbent upon the student to remove a condition at the first opportunity offered. If not so removed it becomes a failure.

Examinations for the removal of conditions and for advanced standing are held at the opening of the school year, from September 19 to 26, 1917. Schedule of examinations may be had upon request.

An opportunity for the removal of first-semester conditions will be given at the Easter recess.

Any student, who, at the end of any given semester, receives grades of *E* or *F* in more than 50 per cent of his registered work in that semester, will be indefinitely dropped for poor scholarship; such percentage to be estimated upon an actual study-hour basis. Any student so dropped will not be eligible to condition examination or to reinstatement excepting upon recommendation of the Students' Work Committee and affirmative vote of the Administrative Board.

REQUIREMENTS FOR GRADUATION

Compliance with the admission requirements; the prior attainment of the degree of Bachelor of Arts or Bachelor of Science, to which one year in medicine for the arts degree, and two years in medicine for the science degree, may contribute; the completion of the full four-year period of required and elective work in the Medical School; an approved hospital internship or advanced laboratory work or public health study for one year; and an unimpeached moral character, are the essentials for graduation.

The required internship insures to the practitioner of medicine a year of varied clinical experience under competent supervision and gives to the public a greater assurance of efficiency in the graduate. The alternative of advanced laboratory work serves to encourage men and women of training who desire to enter the profession of medical teaching. The alternative of public health study meets a growing demand for trained medical sanitarians.

CLINICAL OPPORTUNITIES

THE UNIVERSITY HOSPITALS

The University is fortunate in the ownership and control of the University Hospital service. The Elliot Memorial Building, the product of a bequest of the estate of the late Dr. and Mrs. A. F. Elliot, supplemented by legislative appropriations, provides a present clinic of 192 beds.

The University Hospital system seeks the highest attainable results in the treatment of patients and the training of students. Its clinical service is closely coöperative with the laboratory departments. Its service is free and patients are admitted only upon the certificate of physicians of the state vouching for the applicant's inability to pay ordinary hospital charges and physician's fees, and stating the clinical character of the case.

A service building provides kitchens, dining-rooms, storerooms and quarters for domestic help.

The Outpatient Department of the University Hospitals is housed in Millard Hall. Its service is open to free patients and is conducted by the clinical staff of the Faculty of the Medical School. It is subdivided into medical, surgical, gynecological, obstetrical, children's, eye, ear, nose and throat, skin, syphilis, genito-urinary, nervous and mental, and orthopedic clinics. It enrolled 14,666 new patients and received 52,753 patients' visits during the past year.

Sections of the senior and junior classes are assigned to these clinics daily and are trained in case-history taking, physical examinations and diagnosis, in prescription writing, and in general therapeutic methods.

A Clinical Pathological Conference is held weekly in which the history and clinical manifestations and the gross and microscopic features of cases coming to autopsy are discussed. Members of the faculty and students are invited to participate.

AFFILIATED HOSPITALS

The City Hospital of Minneapolis and the City and County Hospital of St. Paul are closely affiliated with the Medical School of the University. One half of their clinical service is under the direction of the Faculty. Attending and consulting staffs are appointed annually upon the recommendation of the Administrative Board of the School.

The combined resources of these two hospitals cover some 1,400 beds. Every phase of clinical service is represented and clinical material is utilized, so far as possible, by the School.

The State Hospital for the Crippled and Deformed, at Phalen Park, invites the Medical School to full participation in its clinical opportunities. Its superintending surgeon and his aides are members of the faculty. Teaching Fellows and interns of the University Hospital are assigned in rotation to its service. It provides weekly clinics for divisions of the senior class.

Additional clinics are held in other institutions, as the Pillsbury House, the Glen Lake Sanitorium, and the St. Paul Free Dispensary.

LIBRARY

The library of the Medical School consists of the General Library, housed in Millard Hall, and of small collections of books in the departmental libraries of Surgery, Obstetrics, Anatomy, and Pathology and Bacteriology. These departmental collections are readily available to students and investigators. The General Library is open from 9 a.m. to 10 p.m. Some 200 current journals are on file; 15,850 bound volumes and 32,859 unbound volumes and monographs, etc., are cataloged.

The libraries of other schools and colleges in the University and of the Hennepin County and Ramsey County Medical Societies are accessible to students of medicine.

PRIZES, FELLOWSHIPS, AND ASSISTANTSHIPS

The Rollin E. Cutts Prize in Surgery.—Dr. Martha Smith Cutts, '91 medical, established, some years ago, as a memorial to her husband, the late Dr. Rollin E. Cutts, a fund of \$500, the income of which is awarded, in the form of a gold medal, to the member of the senior class of the Medical School who presents the best thesis evidencing original work upon an approved surgical subject.

The Shevlin Fellowship.—A fellowship, representing the income of \$10,000, established in the Graduate School by the late Thomas H. Shevlin, is open to candidates for one full year's work in acceptable medical research.

Several student assistantships and, occasionally, fellowships in the fundamental departments, offer free tuition and varying stipends.

THE SUMMER SESSION

A summer session of six weeks' duration almost immediately follows the commencement exercises in June. The courses in this session are conducted in the laboratories and lecture halls of the Medical School, in the Hospitals and in the Outpatient Department.

Undergraduates in medicine are admitted in the Summer Session to courses of study offered for the following purposes: (1) to secure advanced standing in courses equivalent to those of the regular session; (2) to compensate for deficiencies in studies taken in other acceptable schools; (3) to remove conditions or failures in subjects which are equivalently covered in these courses.

For courses of instruction offered and schedule of tuition fees see Circular of Information of the Summer School.

THE GRADUATE SCHOOL IN MEDICINE

The Graduate School in Medicine has been established as a part of the main Graduate School of the University. It offers to suitably prepared graduates in medicine courses covering two and three years, leading to the Degree of Doctor of Philosophy. The adequate training of specialists in medicine is one of the main purposes of the school and for this purpose, teaching fellowships, under annual stipends, have been created; with an additional number of graduate scholarships, under an abatement of tuition fees, to which selected graduate students receive appointment. An additional number of graduate students in medicine may be received under an annual tuition fee of \$50.

The field of graduate teaching in medicine has been extended to the inclusion of the opportunities for graduate study and medical research offered by the Mayo Foundation for Medical Education and Research, established at Rochester, Minn. Fellows and graduate scholars are assigned to courses of study both at the University and in the Foundation.

Students in the Medical School who have received the Baccalaureate degree from this or any other approved University may become candidates for the degree of Master of Arts, Master of Science, or Doctor of Philosophy in the Graduate School. They will pursue courses of study conforming to the regulations of the Graduate School.

Students registered in the Graduate School may elect majors or minors for the graduate degrees, for which advanced courses are provided, in anatomy, embryology, histology, neurology, pathology, bacteriology, and physiology, in the Medical School.

In all cases, students must comply with the rules and regulations of the Graduate School of the University of Minnesota, further information on which may be found in the Announcement of the Graduate School, or in the Circular of Information on graduate work in medicine. Application blanks for teaching fellowships and scholarships may be had upon request.

OPPORTUNITIES OF STUDY FOR PHYSICIANS

Physicians who desire to attend medical lectures and clinics for a limited period of time may obtain a visitor's ticket from the Dean. They may enter for regular lecture and clinical courses in the Medical School upon payment of a fee of \$10 for each semester. They may arrange for special courses of study in anatomy, physiology, experimental surgery, pathology, bacteriology, pharmacology, etc., at a fee of \$25 per each full semester's course, with additional charge for material used.

THE SCHOOL FOR NURSES

The School for Nurses is a department of University instruction under the control of the Medical School. It is conducted in connection with the University Hospitals. It is in charge of a Superintendent, assisted by

a committee of management and by a teaching staff selected from the Faculty of the Medical School. While the undergraduates of the School for Nurses constitute in part the nursing corps of the University Hospitals, the school exists primarily for the efficient education of the nurse. It is the first school for nurses in the United States organized under direct University control.

A four years' high-school course is the minimal requirement for admission. A six months' preliminary course in foundational studies is given before entry to the hospital service. The full course covers a period of three years. It leads to the degree of Graduate in Nursing conferred, upon the recommendation of the Faculty, by the Board of Regents.

Nurses in training are received from certain affiliated hospitals for the completion of their courses of study.

For further information, see Bulletin of the School for Nurses.

THE SCHOOL OF EMBALMING

With the coöperation of the State Funeral Directors' Association a School of Embalming has been organized by the University, and is conducted for a period of eight weeks, commencing January 3, 1918. It is under the direction of a committee of the Administrative Board of the Medical School.

Didactic and laboratory instruction is given in anatomy, bacteriology, chemistry, public health and sanitation, in autopsies, professional embalming, funeral management, and business principles. Certificates are issued to candidates successfully completing the course and are accepted for state license by the State Board of Health.

Circular of Information will be sent upon application.

THE SOCIAL SERVICE OF THE UNIVERSITY HOSPITALS

A Social Service Department has been established in relation to the hospital system and its outpatient clinics. In addition to the economic values it brings to the clinical service and the benefits which hospital and dispensary patients derive from a trained supervision extending to their homes, it offers opportunities of field work and social study to medical and sociological students.

SUBJECTS	HOURS				TOTAL HOURS
	1st Quar.	2nd Quar.	3rd Quar.	4th Quar.	
FIFTH YEAR					
Pharmacology and Therapeutics... (105)	2	2	2	2	64
Clinical Pathology	4	4	..	..	64
Medicine	6	6	5	5	176
(51 to 55)					
Nervous and Mental Diseases.... (75-76)	..	1	2	2	40
Dermatology	1	1	..	..	16
(91)					
Diseases of Children.....	1	2	2	2	56
(Pediatrics 101-102)					
Principles of Surgery.....	2	2	2	1	56
(53)					
General Surgery.....	2	2	2	..	48
(52)					
Regional Surgery	..	..	3	3	48
(54)					
Surgical Technique.....	..	..	1	1	16
(51)					
Surgical Diagnostic Clinic.....	1	1	1	1	32
(57a,b)					
Obstetrics	2	2	2	2	64
(51-52)					
Gynecology	2	..	..	..	16
(Obst. 53)					
Section Clinics.....	6½	6½	6	6	200
Electives	6	7	7	7	216
Sub-totals	35	36	35	32	1,112
Fifth Year, Total Hours.....					
SUBJECTS	HOURS				TOTAL HOURS
	1st Quar.	2nd Quar.	3rd Quar.	4th Quar.	
SIXTH YEAR					
Therapeutic Conference..... (Pharm. 107)	1	1	..	..	16
Hygiene	2	2	2	2	64
(Path., etc., 106-107)					
Medical Clinic.....	2	2	2	2	64
(Medicine 63-64)					
Mouth Infections.....	..	..	1	..	8
(Medicine 60)					
Medical Jurisprudence.....	..	..	2	..	16
(Medicine 62)					
General Surgery.....	..	..	2	2	32
(55)					
Urology	1	1	..	..	16
(Surgery 73)					
Ophthalmology and Otology.....	2	2	..	..	32
(79)					
Rhinology and Laryngology.....	1	1	..	..	16
(81)					
Obstetrics and Gynecology.....	2	2	3	3	80
(57 to 61)					
Section Clinics and Clerkships...	17	17	17	17	544
Electives	6	6	6	7	200
Sub-totals	34	34	35	33	1,088
Sixth Year, Total Hours.....					

DEPARTMENTAL STATEMENTS*

THE DEPARTMENT OF ANATOMY

Professors CLARENCE M. JACKSON, JOHN B. JOHNSTON, THOMAS G. LEE, RICHARD E. SCAMMON; Associate Professor CHARLES A. ERDMANN; Instructors JAY A. MYERS, ANDREW T. RASMUSSEN, CHESTER A. STEWART; Assistants ERRETT C. ALBRITTON, JOHN A. KITTELSON, JOHN C. MCKINLEY, EDGAR H. NORRIS, FLORIEN VAUGHN.

Departmental Office, Institute of Anatomy

REQUIRED COURSES

- 1a,b. ELEMENTARY HUMAN ANATOMY. School for Nurses. 48 hours; two credits. KITTELSON.
- 3-4. GROSS HUMAN ANATOMY. Dissection, including osteology. A dissected skeleton loaned to every two students. Every student required to dissect lateral half of the body. Third year medical students; 13 hours a week, first semester; 8 hours a week, second semester. 336 hours; ten credits. JACKSON, ERDMANN, MYERS and Assistants.
- 5-6. GROSS HUMAN ANATOMY. Morphology of the various systems. Osteology. Splanchnology, with special reference to the digestive system. Dissection of the head, neck, and trunk. Second year dental students. 288 hours; eight credits. JACKSON, ERDMANN and Assistants.
7. HISTOLOGY AND EMBRYOLOGY. Minute structure and development of the tissues and organs. Second year dental students. 128 hours; four credits. JACKSON, LEE and Assistants.
101. HUMAN HISTOLOGY. Microscopic study of the various tissues and organs. Third year medical students. 160 hours; five credits. SCAMMON, STEWART and Assistants.
102. HUMAN EMBRYOLOGY. Development of the human body. Third year medical students. Prerequisite: Course 101. 96 hours; three credits. LEE, SCAMMON and Assistants.
103. HUMAN NEUROLOGY. A study of the central nervous system and sense organs. Fourth year medical students. Prerequisite: Courses 101, 102. 96 hours; three credits. JOHNSTON, RASMUSSEN and Assistants.

* Courses with number followed by "a,b." are given in each semester. Odd numbers denote first semester, and even numbers second semester courses.

ELECTIVE COURSES

106. DRAWING FOR PUBLICATION. Advanced course in methods, principles and technique of drawings intended for publication. Limited to six students. 40 hours; one and one-half credits. WHITNEY.
108. ADVANCED OSTEOLOGY. Special study of the skull or other regions. Laboratory. 32 hours, one credit. MYERS.
110. SPECIAL EMBRYOLOGY. Detailed study of the development of man and mammals. Supplementary to course 102 which must precede or accompany it. 48 hours, one and one-half credits. SCAMMON.
- 111a,b. ANATOMICAL TECHNIQUE. Microtechnique, reconstruction and museum methods, etc. Fourth, fifth or sixth year medical students. Limited to sixteen students. 96 hours; three credits. LEE.
113. ADVANCED HISTOLOGY. A study of special preparations, including practice in the identification of unknown specimens. Fourth, fifth, or sixth year medical, or graduate students. Limited to sixteen students. Prerequisite: Course 101. 48 hours, one and one-half credits. RASMUSSEN.
114. TOPOGRAPHIC ANATOMY. Based upon a study of serial cross-sections of the human body. Fourth, fifth, or sixth year medical, or graduate students. Prerequisite: Course 3-4. 96 hours, three credits. JACKSON.
115. FETAL ANATOMY. Study of the human fetus, with comparison of earlier embryonic and later post-natal structure. Fourth, fifth, or sixth year medical, or graduate students. Limited to twenty students. Prerequisites: Courses 3-4, 102. 96 hours, three credits. SCAMMON.
117. IMPLANTATION AND PLACENTATION. A study of the implantation of the ovum and the formation of the placenta, and the earliest stages of embryonic development in man and mammals. Fourth, fifth, or sixth year medical, or graduate students. Limited to twelve students. Prerequisite: Course 102 or equivalent. 96 hours; three credits. LEE.
118. APPLIED ANATOMY. Relationships, with reference to their clinical applications. Fourth, fifth, or sixth year medical, or graduate students. Prerequisite: Course 3-4. 48 hours; one and one-half credits. ERDMANN.
119. SPECIAL DISSECTIONS. Dissections of special regions, including preparation of museum specimens. Fourth, fifth or sixth year medical, or graduate students. Limited to twenty-four students. Prerequisite: Course 3-4. 96 hours; three credits. ERDMANN.
120. EXPERIMENTAL NEUROLOGY. A study of the morphology of the central nervous system as determined by experimental methods. Fifth or sixth year medical, or graduate students. Limited to five students. Prerequisite: Course 103. 96 hours; three credits. RASMUSSEN.

- 123-124. **ADVANCED ANATOMY.** Advanced work, largely individual in character, in gross anatomy, histology, embryology, or neurology. Open to fourth, fifth or sixth year medical, or graduate students. Admission only upon approval of instructor. Hours and credits to be arranged. JACKSON, JOHNSTON, LEE, OR SCAMMON.
- 201-202. **RESEARCH IN ANATOMY.** Research work in gross or microscopic anatomy, neurology, histology, or embryology, for properly qualified students, graduates or others, upon approval of any one of the instructors. Hours and credits to be arranged. JACKSON, JOHNSTON, LEE, SCAMMON.
- 203-204. **ANATOMICAL SEMINAR.** Presentation and discussion of research work in progress in the department, together with reviews of current anatomical literature. Open to graduates or others upon approval of instructor. 32 hours; two credits. JACKSON.

THE DEPARTMENT OF PHYSIOLOGY

Professor ELIAS P. LYON; Associate Professors RICHARD OLDING BEARD, FREDERICK H. SCOTT; Assistant Professors JOHN F. MCCLENDON, M. RUSSELL WILCOX; Instructors FRANCIS B. KINGSBURY, CHAUNCEY J. V. PETTIBONE; Assistants CHARLES C. GAULT, EDWARD P. SLATER.

Departmental Office, Millard Hall

REQUIRED COURSES

- *1-2. **ELEMENTARY PHYSIOLOGY AND HYGIENE.** A course planned to afford teachers a helpful knowledge of the human subject. The study of muscle-nerve function; the circulation; respiration; nervous system and senses. Lectures and laboratory work. 48 hours; two credits, each semester. BEARD OR LYON and Assistant.
- *1X-2X. **ELEMENTARY PHYSIOLOGIC CHEMISTRY.** The chemical components of the body and body fluids; physiology of secretion; digestion, absorption, foods; metabolism and excretion. Lectures and laboratory work. 48 hours, two credits in each semester.
- 3a,b. **ELEMENTARY HUMAN PHYSIOLOGY.** School for Nurses, Home Economics students and others. Prerequisites: elementary biology and chemistry. 96 hours; three credits. BEARD OR LYON and Assistants.
4. **ELEMENTARY PHYSIOLOGY.** Sophomore dental students. Prerequisites:

* Courses 1-2 and 1X-2X are offered in alternate years. Together they are designed to cover the field of physiology in its physical and chemical aspects. These courses are given on Saturdays from 9:00 to 12:00 and are primarily for teachers. Course 1-2 will be given in 1917-18; Course 1X-2X in 1918-19.

- elementary biology or anatomy and chemistry. 80 hours; three credits. LYON, BEARD, SCOTT and Assistants.
6. ELEMENTARY PHYSIOLOGIC CHEMISTRY. Sophomore dental students. Prerequisite: organic chemistry. 64 hours; two credits. PETTIBONE, KINGSBURY and Assistants.
102. PHYSIOLOGIC CHEMISTRY. The components of the animal body; foods, digestion, the excreta and metabolism. Third year medical students and others. Prerequisite: organic chemistry. 160 hours; five credits. PETTIBONE, KINGSBURY and Assistant.
103. PHYSIOLOGY OF MUSCLE, NERVE, BLOOD, CIRCULATION, AND DIGESTION. Fourth year medical students and others. Prerequisites: organic chemistry and animal biology. 128 hours; four credits. SCOTT, LYON, BEARD, McCLENDON and Assistants.
104. PHYSIOLOGY OF THE NERVOUS SYSTEM AND SPECIAL SENSES; RESPIRATION, METABOLISM, NUTRITION, AND EXCRETION. Fourth year medical students and others. Prerequisite: organic chemistry and animal biology. 128 hours; four credits. LYON, BEARD, SCOTT, McCLENDON, WILCOX and Assistants.

ELECTIVE COURSES

111. PHYSICAL CHEMISTRY OF CELLS. Osmotic pressure, surface tension and electric conductivity of blood and urine; colloids; permeability of cells and tissues, and changes in permeability produced by electrolytes. Prerequisites: animal biology and two courses in chemistry. 96 hours; three credits. McCLENDON.
112. ELECTRO-PHYSIOLOGY. The bio-electric currents and the theory of stimulation and narcosis. Hydrogen ion concentration and its relation to enzyme activity and irritability. Prerequisites: animal biology and two courses in chemistry. 96 hours; three credits. McCLENDON.
- 113-114. PROBLEMS IN PHYSIOLOGY. Arranged by instructors with qualified students. Each student will be assigned a topic for special laboratory study, leading in some cases to original investigation. Fourth, fifth or sixth year medical students and others. 96 hours; three credits, or more; either or both semesters. LYON, SCOTT, OR McCLENDON.
- 115-116. CONFERENCE COURSE IN PRINCIPLES OF PHYSIOLOGY; STUDENT SEMINAR. Informal lectures and library study. Basis of study, *Bayliss' Text-book*. Fourth, fifth, and sixth year medical students and others. 12 hours, each quarter; one and one-half credits, each semester. LYON, SCOTT, OR McCLENDON.
131. PHYSIOLOGY OF THE BLOOD. Alterations due to physiological conditions. Methods of examination. Fourth, fifth or sixth year medical

- students. Limited to sixteen students. 48 hours; one and one-half credits. SCOTT.
132. *PHYSIOLOGY OF THE CIRCULATION.* Conference and laboratory work. Open to fourth, fifth or sixth year medical students. Limited to sixteen students. Conference may be taken separately. 24 or 48 hours; three-fourths or one and one-half credits. SCOTT.
137. *FOODS AND PRACTICAL DIETETICS.* A study of human foods and food values; of the principles of food selection; of caloric indices and balanced dietaries. Exercises in the practical preparation of foods. Open to fourth, fifth or sixth year medical students. Limited to twelve students. 40 hours; two credits. BEARD, assisted by MISS THOMAS, Dietitian, University Hospital.
138. *PHYSIOLOGY OF DEVELOPMENT.* The physiology of the ovum, the embryo, the fetus; the functions of menstruation, ovulation, pregnancy, parturition and lactation; the functional characteristics of birth, infancy, childhood, adolescence, maturity, and old age. Open to fourth, fifth or sixth year medical students. 32 hours; two credits. BEARD.
139. *EXAMINATION OF THE EYE AND EAR.* A study of advanced methods. Lectures, demonstrations, and laboratory exercises. Prerequisite: Course 104. Open to fifth or sixth year medical students. 24 hours; one credit. WILCOX.
140. *PHYSIOLOGY OF ACCOMMODATION.* A study of optical principles and methods. Lectures, demonstrations, and laboratory exercises. Open to fifth or sixth year medical students. 24 hours; one credit. WILCOX.
- 151-152. *PHYSIOLOGIC CHEMISTRY.* The components of the body, foods, digestion and metabolism. Prerequisite: organic chemistry. Open to qualified students in all divisions of the University. May be taken by medical students in place of Course 102. 96 hours; three credits; in each semester. KINGSBURY.
- 153-154. *ADVANCED PHYSIOLOGIC CHEMISTRY.* Course arranged by instructors with qualified students for special work. Open to fourth, fifth or sixth year medical students and others; may be taken in either semester or both. Prerequisite: Course 102. 96 hours; three credits, either semester or both. PETTIBONE OR KINGSBURY.
161. *URINALYSIS.* Advanced methods. Open to fourth, fifth or sixth year medical and other qualified students. First quarter. Prerequisite: Course 102. 48 hours; one and one-half credits. PETTIBONE.
163. *METABOLISM.* Special phases of metabolism. Lectures may be taken alone; number of students unlimited; laboratory course limited to ten students. Open to fourth, fifth or sixth year medical students and others. Prerequisite: Course 102. 48 hours; three-fourths or one and one-half credits. PETTIBONE.

164. QUANTITATIVE METHODS. The estimation of certain important substances in the urine, blood and other body fluids. Open to fourth, fifth or sixth year medical students and others. Prerequisite: Course 102. 96 hours; three credits. KINGSBURY.
- 201-202. SEMINAR IN PHYSIOLOGY AND PHARMACOLOGY. For instructors and advanced students. 16 hours, each semester; one credit. LYON, HIRSCHFELDER and Staff.
- 203-204. RESEARCH IN PHYSIOLOGY. Hours and credits arranged. LYON, SCOTT, OR MCCLENDON.
- 205-206. RESEARCH IN PHYSIOLOGIC CHEMISTRY. Hours and credits arranged. KINGSBURY OR PETTIBONE.
208. SEMINAR IN PHYSIOLOGIC OPTICS. Primarily for graduate students. Open to sixth year medical students. 24 hours; one and one-half credits. LYON.
- PHYSIOLOGIC OPTICS. A laboratory course. For graduate and sixth year students. 48 hours. One and one-half credits. LYON.

DEPARTMENT OF PHARMACOLOGY

Professor ARTHUR D. HIRSCHFELDER; Associate Professor EDGAR D. BROWN; Instructor.....

Departmental Office, Millard Hall

REQUIRED COURSES

- 1a,b. ELEMENTARY PHARMACOLOGY. A study of the history, uses, classification and preparation of drugs; definition of descriptive terms; systems of weights and measures; methods of administration, principles of dosage, etc. School for Nurses and others. 64 hours; three credits.
4. COURSE IN PHARMACOLOGY. The history, origin, nature, pharmacal preparations, and uses of drugs, including the discussion of their physiologic, pharmacologic, and therapeutic actions. Second year dental students. 48 hours; three credits.
102. GENERAL PHARMACOLOGY. The principles underlying the structure, physico-chemical properties, physiologic, therapeutic, and toxic actions of substances, natural or synthetic, used as medicines. Fourth year medical students. 32 hours; two credits. HIRSCHFELDER, BROWN.
104. EXPERIMENTAL PHARMACOLOGY. Exercises illustrating the preparation and action of medicines, their relation to chemical structure and their mode of administration. Fourth year medical students. 48 hours; one and one-half credits. HIRSCHFELDER, BROWN.

105a,b. GENERAL PHARMACOLOGY AND THERAPEUTICS. A more detailed study of drugs important in clinical practice, covering the relations of chemical structure to physiologic and therapeutic action and modes of application in clinical medicine. Fifth year medical students. 48 hours; two credits. HIRSCHFELDER, BROWN.

107a,b. THERAPEUTIC CONFERENCE. A systematic discussion of the causation of disease in relation to therapeutics, studied upon actual cases at the bedside; followed by demonstrations of similar conditions produced experimentally in the laboratory. Sixth year, each quarter; to clinic clerks in medicine. Eight hours. HIRSCHFELDER, ROWNTREE.

ELECTIVE COURSES

6. EXPERIMENTAL PHARMACOLOGY. Experiments upon the effects of the important heart and nerve stimulants, sedatives, purgatives and antiseptics. Offered to dental and pharmacy students and nurses. 24 to 48 hours; one to two credits. HIRSCHFELDER, BROWN.

109a,b. EXPERIMENTAL PHARMACOLOGY. Special investigation and experimental study of one or more subjects in pharmacology, in which the student is given an opportunity of choice of the following topics:

a. Anesthetics, general and local; the principles and dangers of anesthesia.

b. Stimulants and depressants of the circulation and their relation to the treatment of heart disease.

c. Drugs acting upon the kidneys, normal or diseased.

d. Urinary antiseptics and the urinary excretion of drugs.

e. Action and detection of poisons and their antidotes.

f. Detailed study of the effects in man of the common harmless drugs.

g. The internal secretions and gland extracts; their effect upon the action of drugs.

h. Action of drugs upon animal and bacterial parasites, tumors, etc.

Offered in the second half of the fourth year and in the entire fifth or sixth year. 24 or 48 hours; one or two credits, each semester. HIRSCHFELDER, BROWN.

110. POISONS. Their detection, actions, and antidotes. Open to fourth, fifth or sixth year medical students. 48 hours; one and one-half credits. BROWN.

111a,b. PRESCRIPTION WRITING. The principles of prescription writing; study of the flavoring, coloring, and incompatibilities of drugs. Open to fourth, fifth or sixth year medical students. 16 hours; one credit. BROWN.

112. PRACTICAL MATERIA MEDICA AND PRESCRIPTION WRITING. The study of crude drugs, pharmaceutical preparations and of the flavoring and

compounding of prescriptions. Open to fourth, fifth and sixth year medical students. 8 hours; one-half credit. BROWN.

113a,b. THE PHYSIOLOGICAL AND CHEMICAL BASIS OF PHARMACOLOGY. The relation of drug action to chemical structure; the mode of action and therapeutic application of various synthetic drugs; the study of chemotherapy. Primarily for students in the School of Chemistry. 80 hours; three credits. HIRSCHFELDER.

201-202. SEMINAR IN PHYSIOLOGY AND PHARMACOLOGY. Reviews of recent literature bearing upon physiologic and pharmacologic subjects. Conducted by department directors, with the collaboration of the staffs and of qualified graduate or undergraduate students. 32 hours.

203-204. RESEARCH IN PHARMACOLOGY. HIRSCHFELDER, BROWN.

THE DEPARTMENT OF PATHOLOGY, BACTERIOLOGY, AND PUBLIC HEALTH

Professor HAROLD E. ROBERTSON; Associate Professors ELEXIOUS T. BELL, WINFORD P. LARSON; Assistant Professor MOSES BARRON; Instructors ANNE G. BENTON, ARTHUR T. HENRICI, MARGARET WARWICK; Assistants HAROLD S. DIEHL, KANO IKEDA, PERCY A. WARD.

Departmental Office, Institute of Public Health and Pathology

REQUIRED COURSES

3. BACTERIOLOGY. The principles governing the isolation and study of bacteria. The bacteria and other parasites of the mouth and teeth. Studies of pathogenic organisms which produce, or appear in rheumatism; relation to infections of the teeth. Dental students. 96 hours; four credits. HENRICI.

4. PATHOLOGY. The study and recognition of gross and microscopic disease processes. The principles of general pathology with special consideration of diseases peculiar to the mouth and teeth and important in dental practice. Dental students. 96 hours; four credits. ROBERTSON, HENRICI.

6a,b. ELEMENTARY BACTERIOLOGY. The principles and technique of general bacteriology. Studies in the morphologic and biologic characters of the common bacteria. Preparation of culture media. Disinfectants and disinfection. Bacteriology of water and food products. Students of Home Economics, Agriculture, Nursing, etc. 80 hours; three credits. LARSON, HENRICI, DIEHL, WARD, IKEDA.

101. GENERAL PATHOLOGY. The general principles governing pathologic changes, including disturbances of the circulation and metabolism; inflammation, regeneration, and repair; tumor formation. The study

and recognition of gross and microscopic lesions. Fourth year medical students. Prerequisites: histology and special bacteriology. 96 hours; four credits. ROBERTSON, BELL, WARD.

102. SPECIAL PATHOLOGY. The study of the pathologic processes of infectious diseases, such as diphtheria, typhoid fever, etc.; the special pathology of lesions in various organs, systems of organs and tissues of the body. Fourth year medical students. Prerequisite: general pathology. 232 hours; eight credits. ROBERTSON, BELL, BARRON, WARD.
103. CLINICAL PATHOLOGY. The principles and methods involved in the examination of urine, blood, stomach contents, feces, sputum, exudates and transudates; the relation of pathologic findings to the diagnosis of disease. Fifth year medical students. 64 hours. BARRON, WARD.
104. GENERAL BACTERIOLOGY. The preparation of culture media; the morphology of bacteria; methods of staining and identification; anaerobic bacteria; principles of sterilization and disinfection; examination of air, water, milk; relation of bacteriology to the industries. Third year medical students and others. Prerequisites: general chemistry, and botany or zoology. 96 hours; four credits. LARSON, BENTON.
105. SPECIAL BACTERIOLOGY. The study of pathogenic bacteria, especially in relation to definite diseases; bacteriological methods in clinical diagnosis; principles of infection and immunity, with practical application of serum reactions. Fourth year medical students and others. Prerequisite: general bacteriology. 72 hours; three credits. LARSON, BENTON, WARD.
106. PREVENTIVE MEDICINE AND HYGIENE. Systematic study of the principles which govern the various procedures in the protection of public health. Sixth year medical students. 32 hours. ROBERTSON.
- 109a,b. CLINICAL PATHOLOGY. Practical work in the examination of blood, urine, stomach contents, sputum, etc. Conducted in the Outpatient Department with class sections. Sixth year medical students. 12 hours. WARWICK.
- 111a,b. AUTOPSIES. The technique of performing autopsies; making autopsy records; the examination of fresh organs removed from these autopsies. Opportunities afforded to study the observed lesions microscopically. Three or four students called to each post-mortem, excused from regular classes. Preference given to senior students. Each candidate for the degree must have taken part in at least four autopsies. Fifth and sixth year medical students. The Staff.

ELECTIVE COURSES

112. **PATHOLOGIC TECHNIQUE.** General and special methods of preparation of microscopic and gross pathologic specimens; including practice with freezing microtome, celloidin and paraffin embedding methods, general and special stains, preparation of museum specimens, etc. Limited to ten students. Fourth, fifth and sixth year medical students. Prerequisite: general pathology. 48 hours; one and one-half credits. ROBERTSON.
- 113a,b. **ADVANCED PATHOLOGY.** Laboratory studies in the examination of routine operative and autopsy specimens, with the investigation of special associated problems. Credit for work in this course is to be judged entirely by the character and amount of work accomplished. Dates and hours to be arranged. The Staff.
114. **ADVANCED BACTERIOLOGY.** An advanced course giving additional work in bacteriology and the opportunity of working out special problems. Fifth year medical students. Limited to ten students. 48 hours; one and one-half credits. LARSON.
- 115a,b. **COURSE IN IMMUNITY.** Laws of hemolysis. Quantitative relationship between antigen and antibody. Wassermann reaction. Opsonins. Vaccines. Precipitin reaction. Abderhalden reaction. Anaphylaxis. Fifth and sixth year medical students. Limited to ten students in each semester. 48 hours; one and one-half credits. LARSON.
117. **DIAGNOSIS OF TUMORS.** Rapid diagnosis and study of tumors and other pathologic conditions simulating tumor formation. Fifth and sixth year medical students. Prerequisite: special pathology. 48 hours; one and one-half credits. BELL.
118. **GYNCOLOGICAL PATHOLOGY.** The special study of pathologic conditions found in the female genital tract. This elective is an integral part of Course 102, special pathology. Fourth, fifth or sixth year medical students. 48 hours; one and one-half credits. BELL, ADAIR.
120. **NEUROPATHOLOGY.** The special study of pathologic conditions of the nerve tissues in lesions of the central and peripheral nervous system. This elective is an integral part of Course 102, special pathology. Fourth, fifth or sixth year medical students. 24 hours; three-fourths credit. BELL, HAMILTON.
121. **CLINICAL LABORATORY COURSE.** Practical diagnostic study in the outpatient department laboratory. Limited to sections of four students. Fifth or sixth year medical. 18 hours; one-half credit. WARWICK.
122. **MEDICAL ENTOMOLOGY.** A study of insects, and their allies, which are disease-bearers or parasites of man; life-history, habits and

methods of control. Fourth, fifth or sixth year students. Prerequisite: animal biology. 32 hours; two credits. HOWARD.

124 HEMATOLOGY. Advanced studies in diseases of the blood; with particular attention to special technical procedures and the significance of laboratory findings. Fifth or sixth year medical students. 48 hours; one and one-half credits. BARRON.

201-202. RESEARCH. Graduate students, of the necessary preliminary training, may elect research, either as majors or minors in pathology. Hours and credits to be arranged. ROBERTSON, BELL.

203-204. RESEARCH. Graduate students of the necessary preliminary training may elect research, either as majors or minors, in bacteriology. Hours and credits to be arranged. LARSON.

ELECTIVE COURSES

Offered by members of the State Board of Health Staff and by the Director of Hygiene of the Minneapolis Schools

125. EPIDEMIOLOGY. Office and field work in Division of Preventable Diseases of the State Board of Health. Collection and uses of morbidity reports; prevalence, sources, modes of spread of communicable diseases; practical methods of control and prevention. Limited to two students. Dates and hours to be arranged. ALBERT J. CHESLEY, M.D., Director of Division.

126. LABORATORY DIAGNOSIS. Routine laboratory diagnoses in State Board of Health Laboratory. Diphtheria culture examinations; virulent and non-virulent diphtheria carriers; Widal reactions; identification of typhoid carriers; examination of sputa and body fluids for tubercle bacilli; preparation of typhoid vaccine. Limited to two students. Dates and hours to be arranged. ETHEL M. WADE, M.A., Chief, Main Laboratory.

127. PASTEUR INSTITUTE. The diagnosis and prophylaxis of rabies; inoculation of animals; autopsies on animals; preparation of fixed virus spinal cords; administration of antirabic vaccine to patients; study of Negri bodies. Special phases of work for investigation and report. Limited to two students. Dates and hours to be arranged. ORIANNA McDANIEL, M.D., Chief, Pasteur Institute.

128. SANITATION. Practical work on environmental sanitation in the Division of Sanitation. Water supplies, milk supplies, sewerage systems, trade wastes, garbage disposal; the sanitation of public buildings; field surveys, laboratory examinations, interpretation of results, reports, etc. Limited to two students. Dates and hours to be arranged. HAROLD A. WHITTAKER, B.A., Director, Division of Sanitation.

129. PUBLIC SCHOOL MEDICAL WORK. Lectures on the duties and qualifications of school medical officers. Fifth and sixth years. 8 hours. CHARLES H. KEENE, M.D., Director of Hygiene, Minneapolis Schools.
- 131a,b. PRACTICAL MEDICAL WORK, in the schools of Minneapolis, by school physicians. Fifth and sixth years, 24 hours. DR. KEENE and others.

THE DEPARTMENT OF SURGERY

Professors JAMES E. MOORE, ARTHUR J. GILLETTE; Associate Professors J. FRANK CORBETT, ARTHUR A. LAW, ARCHIBALD MACLAREN, ARTHUR T. MANN, JOHN T. ROGERS; Assistant Professors ALEXANDER R. COLVIN, EMIL S. GEIST, OSCAR OWRE, HARRY P. RITCHIE, ARTHUR C. STRACHAUER, FRANKLIN R. WRIGHT; Instructors JOHN S. ABBOTT, PAUL F. BROWN, CARL C. CHATTERTON, WALLACE COLE, JAMES A. JOHNSON, FREDERICK H. POPPE, CHARLES A. REED, HARRY B. ZIMMERMAN; Assistants PAUL W. GIESSLER, EUGENE K. GREEN, CHARLES A. HALLBERG, HUGO HARTIG, JOHN P. HIEBERT, WALTER J. KREMER, HENRY C. STUHR, ANTON J. WETHALL; Teaching Fellows DONALD F. CAMERON, GOLDER L. MCWHORTER.

Departmental Office, Millard Hall

REQUIRED COURSES

51. GENERAL SURGERY. The diseases and injuries of tendons, fasciae, bursae, blood-vessels, nerves, brain, and meninges. Lectures and demonstrations. Fifth year. 32 hours. LAW.
52. SURGICAL QUIZ. For fifth year students. 16 hours. MOORE.
- 53-54. PRINCIPLES OF SURGERY. A study of surgical inflammations, etc.; illustrated by gross and microscopic preparations from the living subject and from experimental courses. Lectures and demonstrations. Fifth year. 56 hours. CORBETT.
56. REGIONAL SURGERY. The practical surgery of the several regions of the body; diseases of bones, injuries and acute diseases of joints, etc. Lectures and demonstrations. Fifth year. 48 hours. MOORE.
58. GENERAL SURGERY. Fractures and dislocations. Lectures and demonstrations. Sixth year. 32 hours. LAW.
- 59-60. DIAGNOSTIC CLINIC. A series of clinics upon the diagnosis of surgical conditions as presented in the hospital wards. Fifth year. 32 hours. MOORE.
- 61-62. DIAGNOSTIC AND OPERATIVE CLINIC. A course in operative procedure conducted at the University Hospitals, the Minneapolis City Hospital, and the City and County Hospital at St. Paul, on Thurs-

days and Saturdays, throughout the year. Fifth year class, in sections. 56 hours. MOORE, LAW, MACLAREN, RITCHIE, STRACHAUER, CORBETT, MANN, POPPE, ROGERS, COLVIN.

- 63a,b. CLINICAL CLERKSHIPS. Direct observation of patients in hospital, under supervision of senior internes or teaching fellows; taking and recording of case histories and making of provisional diagnoses. Sixth year. 64 hours, each quarter. Clinical Staff.
- 64a,b. OPERATIVE CLINIC. A course of operations in the University Hospitals, the Minneapolis City Hospital, and the City and County Hospital at St. Paul, on Tuesdays, Thursdays, and Saturdays. For sections of class; sixth year. 48 hours. MOORE, LAW, MACLAREN, RITCHIE, STRACHAUER, CORBETT, MANN, POPPE, ROGERS, COLVIN.
- 65a,b. MINOR OPERATIVE CLINICS. Course conducted with class sections on three days in each week at the Out-patient Department. Sixth year. 12 hours. JOHNSON and Assistants.
66. MEDICAL ETHICS AND ECONOMICS. Sixth year. 8 hours. MOORE.

ELECTIVE COURSES

- 101a,b. COURSE IN MINOR SURGERY. The study of diagnosis and treatment of selected cases. Sixth year. 36 hours. JOHNSON and Assistants.
103. OPERATIVE COURSE ON THE CADAVER. The technique of abdominal incision and closure; of bowel suturing, appendiceal removal, kidney exploration, nephrotomy, tracheotomy, amputations, ligations, and other problems in emergency surgery. Fifth year. 32 hours. CORBETT.
- 104a,b. SURGICAL PROBLEMS. A study of approved problems, selected by students in the course, in operative, physiological, histological, and chemical methods. Fifth year. 24 hours, or more. CORBETT.
106. COURSE IN TUMORS. The pathology and diagnosis of tumors, classified by anatomical relation. Sixth year. 24 hours. CORBETT.
108. COURSE IN EXPERIMENTAL SURGERY. A study of surgical technique by cardinal operations upon animals. Sixth year. 40 hours. CORBETT.
- 109a,b. DIAGNOSTIC CLINIC, WITH OCCASIONAL OPERATIONS. Conducted at the City and County Hospital, St. Paul. Limited to ten students. Fifth or sixth year. 12 hours. COLVIN.
110. LOCAL ANESTHESIA. Methods and applications of local anesthesia in both major and minor surgery. Fifth and sixth year. 8 hours. STRACHAUER.
- 111a,b. EXTRACTION OF TEETH. Course offered in the College of Dentistry. Limited to eight students. Fifth or sixth year. 8 hours. GRIFFITH.

112. SURGICAL QUIZ. A review of surgical studies by recitation and conference. Sixth year. 16 hours. MANN.
- 119a,b. BEDSIDE SURGICAL CLINIC. Limited to four students. Repeated each quarter in the sixth year. 8 hours. MOORE.

DIVISION OF ORTHOPEDIA

REQUIRED COURSES

- 70a,b. ORTHOPEDIC SURGERY. A course of clinical lectures and operations conducted in each quarter, with divisions of class, at the Hospital for Crippled and Deformed at Phalen Park. Sixth year. 24 hours. GILLETTE, CHATTERTON.
- 71a,b. ORTHOPEDIC CLINIC. A study of cases of orthopedic disease and treatment at the Out-patient Department; with class sections, three weekly sessions. Sixth year. 8 hours. GEIST, REED, COLE.

ELECTIVE COURSES

- 113a,b. CLINIC IN ORTHOPEDIC SURGERY. The study of selected cases. Conducted in Out-patient Department. Limited to three students. Sixth year. 36 hours. GEIST, REED.
114. ORTHOPEDIC SURGERY. Illustrated clinical lectures. Sixth year. 24 hours. GEIST.
- 115a,b. CLINIC IN ORTHOPEDIC SURGERY. Conducted at Phalen Park Hospital for the Crippled and Deformed. 24 hours in each semester. COLE.

DIVISION OF UROLOGY

REQUIRED COURSES

73. GENITO-URINARY DISEASES. The etiology, diagnosis, and treatment of this group of diseases. A course of lectures. Sixth year. 16 hours. WRIGHT.
- 75a,b. GENITO-URINARY CLINIC. The study of cases at the bedside and in the operating rooms of the several hospitals. Sixth year. 8 hours. WRIGHT, OWRE.
- 77a,b. GENITO-URINARY CLINIC. The observation, examination, and treatment of patients in the Out-patient Service at three weekly sessions. Sixth year. 8 hours. WRIGHT, OWRE, and Assistants.

ELECTIVE COURSES

- 117a,b. GENITO-URINARY DISEASES. The study of cases in the Out-patient

clinics, giving the student the opportunity of examination and supervised treatment of patients. Sixth year. 36 hours. WRIGHT, OWRE, and Assistants.

- 118a,b. ENDOSCOPY AND CYSTOSCOPY. Methods of investigation and treatment. Conducted in Out-patient Department. Sixth year. 8 hours. WRIGHT.

THE DEPARTMENT OF MEDICINE

Professors LEONARD G. ROWNTREE, ARTHUR S. HAMILTON, S. MARX WHITE, ARTHUR A. SWEENEY; Research Professor THOMAS B. HARTZELL; Associate Professor JAMES S. GILFILLAN; Assistant Professors FRANCIS G. BLAKE, ERNEST M. HAMMES, ANGUS W. MORRISON, SAMUEL E. SWEITZER, HENRY L. ULRICH; Lecturer HENRY WIREMAN COOK; Instructors JOHN M. ARMSTRONG, J. FOWLER AVERY, ARCHIBALD H. BEARD, JOHN BUTLER, PAUL B. COOK, CHARLES RALPH DRAKE, EDWIN L. GARDNER, ALEXANDER R. HALL, HARRY J. IRVINE, GEORGE M. OLSON, HAROLD PEDERSON, ERNEST T. F. RICHARDS, ROBERT I. RIZER, JOHN P. SCHNEIDER, FREDERICK W. WITTICH, CHARLES B. WRIGHT; Research Assistant WILLIAM A. GREY; Assistants J. WARREN BELL, LOUISA L. BOUTELLE, EDWARD J. ENGBERG, WALTER A. FANSLER, ARNOLD L. HAMEL, OLGA S. HANSEN, ADOLPH E. LOBERG, FRANK S. MCKINNEY, ERNEST S. MARIETTE, JOSEPH C. MICHAELS, FREDERICK P. MOERSCH, HARRY P. NORDLEY, JOHN H. SCHROEDER, HOMER R. SMITH, COURT R. STANLEY; Teaching Fellows FLOYD GRAVE, RALPH EDWIN MORRIS, HENRY W. WOLTMANN.

Departmental Office, Millard Hall

REQUIRED COURSES

50. PHYSICAL DIAGNOSIS. A study of general symptomatology and of methods of physical examination, diagnosis, and record, with demonstrations upon the normal and abnormal subject; introductory to the group teaching of physical diagnosis in the fifth year. Fourth year. 24 hours. ROWNTREE, SCHNEIDER, and Assistants.
- 51-52. THE PRINCIPLES AND PRACTICE OF MEDICINE. Diseases of the heart and bloodvessels; of the bronchi, lungs, and pleura; of the intestinal tract; renal diseases; acute infections. Fifth year. 64 hours. ROWNTREE, WHITE, BLAKE, RICHARDS, RIZER, GARDNER, WITTICH.
- 53a,b. PHYSICAL DIAGNOSIS AND CASE-TAKING. Studies conducted, with divisions of the class, in the following clinics: (1) cardiac and vascular diseases; (2) respiratory diseases and tuberculosis; (3) metabolic diseases; (4) gastro-intestinal diseases; (5) nervous diseases; (6) dermatology and syphilis. See also Courses 77 and 85. Fifth

- year. 144 hours. SCHNEIDER, RIZER, AVERY, WITTICH, WRIGHT, BEARD, MORRISON, SWEITZER, IRVINE, BUTLER, OLSON, and Assistants.
55. PHYSICAL DIAGNOSIS. A course of lectures in elaboration of the practical work in the outpatient service. Fifth year. 16 hours. SCHNEIDER, RIZER, WITTICH.
56. PRACTICAL THERAPY AND THERAPEUTIC TECHNIQUE. A study of special methods of therapeusis. Fifth year. 16 hours. RICHARDS, BEARD.
- 57a,b. CLINIC IN MEDICINE. Conducted in the University Hospital. Fifth year; one half the class in each semester. 16 hours. ULRICH.
- 59a,b. SECTION CLINICS IN MEDICINE. Conducted throughout the year in the Minneapolis City Hospital and the City and County Hospital, St. Paul. Fifth year. 48 hours. GILFILLAN, HALL, PEDERSON, GARDNER.
60. MOUTH INFECTIONS. The typical infections of the oral cavity and their casual relations to disease. Fourth quarter. Sixth year. 8 hours. HARTZELL.
62. MEDICAL JURISPRUDENCE. The principles of law, the rules of evidence and the duties of physicians in medico-legal cases. Third quarter. Sixth year. 16 hours. SWEENEY.
- 63a,b. CLINIC IN MEDICINE. A study of cases and case histories in the University Hospital service. Sixth year. 64 hours. ROWNTREE, WHITE.
- 65a,b. CLINICAL CLERKSHIPS. The personal and direct observation of patients in hospital under the supervision of the staff; the taking and recording of case histories and the making of provisional diagnoses. One fourth of class in each quarter. Hospital open for this service from 9:30 to 12 and 1 to 4:30. Sixth year. 144 hours.
- 67a,b. SECTION CLINICS IN MEDICINE. Conducted throughout the year at the Minneapolis City Hospital and the City and County Hospital of St. Paul. Sixth year. 8 hours. GILFILLAN, HALL, PEDERSON, GARDNER.
- 107a,b. CLINICAL-THERAPEUTIC CONFERENCE. A weekly conference in which the clinical features and the treatment of cases are discussed; followed by a reproduction of corresponding lesions and therapeutic effects in the animal. Sixth year. 32 hours. ROWNTREE, HIRSCHFELDER.

ELECTIVE COURSES

- 101a,b. CLINICAL ELECTIVES, offering the student an assistantship in the Outpatient Department in any of the services in medicine, nervous and mental diseases, and dermatology and syphilis. For services,

see Courses 53, 119, 121. Sixth year. Open to two students, who have completed clinical clerkships, in each service and in each quarter. 36 hours. The Staff.

- 103a,b. **BEDSIDE CLINICS IN MEDICINE.** Conducted at the City and County Hospital, St. Paul. Limited to ten students. Fifth year. 12 hours. HALL.
104. **THE EXAMINATION FOR LIFE INSURANCE.** The requirements of standard and special examinations of applicants for life insurance. Fifth or sixth year. 8 hours. COOK.
105. **ACUTE INFECTIOUS DISEASES.** Non-contagious. A comparative study of fevers. City Hospital. Limited to six students. Sixth year. 8 hours.
106. **DISEASES OF THE RESPIRATORY TRACT.** A study of physical signs. City Hospital. Limited to six students. Fifth year. 8 hours.
108. **ADVANCED WORK IN GRAPHIC RECORDING AND FUNCTIONAL DIAGNOSIS OF CARDIO-VASCULAR DISEASES.** A study of the use of the polygraph and electro-cardiograph. Limited to six students. Sixth year. 16 hours. WHITE.
- 109a,b. **ADVANCED PHYSICAL DIAGNOSIS OF THE CHEST.** Practical work on tuberculosis patients at available hospitals. Two classes of six students each. Fifth and sixth year. WITTICH and Associates.
110. **STUDIES IN METABOLISM, CLINICAL AND EXPERIMENTAL.** Limited to six students. Sixth year. 48 hours. ROWNTREE and Staff.
111. **PROBLEMS IN ADVANCED MEDICAL DIAGNOSIS.** Limited to four students. Sixth year. 16 hours. ULRICH.

DIVISION OF NERVOUS AND MENTAL DISEASES

REQUIRED COURSES

69. **NEUROLOGY AND NEUROLOGIC DIAGNOSIS.** The general symptomatology and methods of examination of the nervous system; the etiology, pathology, diagnosis and treatment of the special diseases of the nervous system. Lectures, recitations, and lantern demonstrations. Fifth year. 24 hours. HAMILTON, HAMMES.
70. **PSYCHIATRY.** The principal data and methods of modern psychiatry, with the diagnosis and treatment of the various mental disorders. Lectures, recitations, and demonstrations. Prerequisite: Course 75. Fifth year. 16 hours. HAMILTON.
- 71a,b. **CLINICAL NEUROLOGY AND PSYCHIATRY.** Section clinics in nervous and mental diseases, conducted at the University Hospital, the Minneapolis City Hospital, and the City and County Hospital, St. Paul.

Fifth year. 20 hours. HAMILTON, HAMMES, MORRISON, WOLTMANN.

73a,b. ADVANCED SECTION CLINICS conducted at the above hospitals throughout the year. Sixth year. 20 hours. HAMILTON, HAMMES.

75a,b. PERSONAL OBSERVATION AND STUDY of cases of nervous and mental disease in the University Out-patient Service. In sections. Sixth year. 12 hours. MORRISON, WOLTMANN.

77a,b. PHYSICAL DIAGNOSIS AND CASE-TAKING. Studies conducted with divisions of the class in medical clinics, including neurology, in the Outpatient Department. See Course 53a,b. Fifth year. 24 hours. MORRISON.

ELECTIVE COURSES

113. PATHOLOGY OF THE NERVOUS SYSTEM. The exhibition of gross and microscopic preparations of diseased nerve tissues; the relations existing between pathologic lesions and signs and symptoms; the chief neurone systems and the principles underlying their degeneration. Limited to four students. Prerequisites: Courses 75 and 76. Sixth year. 8 hours. HAMILTON, WOLTMANN.

115. ORGANIC NERVOUS DISEASES. Advanced diagnosis of nervous diseases, with a view of giving each student practical experience in all the chief diagnostic procedures employed in the study of nervous diseases. Limited to four students. Prerequisites: Courses 75 and 76. Sixth year. 16 hours. HAMILTON.

116. SYPHILITIC NERVOUS AFFECTIONS. The diagnosis and treatment of the expressions of syphilis in the central nervous system, combining clinical and laboratory teaching and referring particularly to dementia paralytica and tabes dorsalis. Limited to six students. Sixth year. 16 hours. HAMMES.

118. REGIONAL DISEASES. A didactic and clinical conference on the regional diagnosis of lesions of the nervous system. Limited to four students. Third quarter, sixth year. 8 hours. MORRISON.

119a,b. CLINICAL ASSISTANTSHIP, in nervous and mental diseases in the Outpatient Department. Sixth year. Open to two students in each quarter. 36 hours. MORRISON.

DIVISION OF DERMATOLOGY

REQUIRED COURSES

79. COURSE IN DERMATOLOGY. Clinical lectures upon the common skin diseases and syphilis, including diagnosis and treatment. Fifth year. 32 hours. SWEITZER.

81. a,b. CLINICAL DERMATOLOGY. Section clinics conducted at the City and County Hospital, St. Paul. Sixth year. 4 hours.
- 83a,b. CLINIC IN DERMATOLOGY. The practical study of cases of skin and syphilitic disease, in the Outpatient Service. Sixth year. 12 hours. SWEITZER, BUTLER, IRVINE, OLSON.
- 85a,b. PHYSICAL DIAGNOSIS AND CASE-TAKING. Studies conducted with divisions of the class in medical clinics, including dermatology and syphilis, in the Outpatient Department. See Course 53a,b. Fifth year. 24 hours. SWEITZER, IRVINE, BUTLER, OLSON.

ELECTIVE COURSES

- 121a,b. ASSISTANTSHIP IN DERMATOLOGY, in the Outpatient Department. Sixth year. Open to two students in each quarter. 36 hours. SWEITZER, BUTLER, IRVINE, OLSON.
- 123a,b. WARD CLINICS IN DERMATOLOGY. Conducted in the City and County Hospital, St. Paul. Limited to ten students. Fifth or sixth year. 12 hours.

THE DEPARTMENT OF OBSTETRICS AND GYNECOLOGY

Professor JENNINGS C. LITZENBERG; Associate Professors JOHN L. ROTHROCK, FRED L. ADAIR; Instructors WILLIAM H. CONDIT, RAE T. LAVAKE, CLARENCE O. MALAND, JALMAR SIMONS; Assistants JAMES F. HAMMOND, BRUCE JARVIS, MENDELSSOHN JONES, WILLMAR C. RUTHERFORD, FREDERICK J. SOUBA; Teaching Fellow LEE W. BARRY.

Departmental Office, Institute of Anatomy

REQUIRED COURSES

- 51-52. OBSTETRICS. The physiology and pathology of pregnancy, parturition and the puerperium. Lectures and recitations. Fifth year. 64 hours. ADAIR, CONDIT.
53. GYNECOLOGY. Course in gynecologic diagnosis. Fifth year. 16 hours. LITZENBERG.
- 55a,b. CLINICS IN OBSTETRICS AND GYNECOLOGY. Sections of the class at the Minneapolis City Hospital, City and County Hospital, St. Paul. Fifth year. 10 hours. ROTHROCK AND RUTHERFORD; ADAIR AND SIMONS, and Assistants.
- 57a,b. OBSTETRICS. A study of the pathology of pregnancy and parturition and of the puerperium. Sixth year. 32 hours. LITZENBERG.
- 59a,b. GYNECOLOGY. A study of the diseases of women. Sixth year. 32 hours. LITZENBERG.

61. CASE ANALYSIS IN OBSTETRICS AND GYNECOLOGY. A course in the analytical study of cases. Sixth year. 16 hours. LITZENBERG.
- 63a,b. CLINIC IN OBSTETRICS AND GYNECOLOGY. Demonstrations, diagnosis, and treatment of cases in the Outpatient Department. Sections of class, sixth year. 12 hours. ADAIR and Assistants.
- 65a,b. CLINICS IN OBSTETRICS AND GYNECOLOGY. Demonstrations, diagnosis and treatment of cases. Conducted in Minneapolis City Hospital and City and County Hospital, St. Paul. Sections of class, sixth year. 24 hours. ROTHROCK, ADAIR, SIMONS, and Assistants.
- 67a,b. CLINICAL CLERKSHIPS. The direct observation of patients in hospital, under supervision; the taking and recording of case histories; the making of provisional diagnoses; including parturition clinics in hospital and outpatient service; operations and manikin demonstrations. Sixth year, in sections. 32 hours. LITZENBERG and Associates.
- 69a,b. PARTURITION CLINICS. Conducted in the University Hospital and the Outpatient service, at the Minneapolis City Hospital and the City and County Hospital, St. Paul. Students are on call for parturition cases; attendance required. No credits. Fifth and sixth years. ADAIR, RUTHERFORD, and Assistants.

ELECTIVE COURSES

- 101a,b. SEMINAR IN OBSTETRICS. Offering opportunities of advanced study. Limited to eight students. Sixth year. 16 hours. LITZENBERG.
- 103a,b. SPECIAL CLINICAL COURSE. A study in the diagnosis and treatment of diseases of women and of obstetrical conditions, at the Outpatient Department. Limited to four students. Sixth year. 36 hours. CONDIT.
- 105a,b. Same as above course. Fifth year. 8 hours. ADAIR.
- 107a,b. Same as above courses. Sixth year. 8 hours. ADAIR.
109. GYNECOLOGICAL CLINIC. A study in the diagnosis and treatment of diseases of women. Conducted in the St. Paul Dispensary. Two students. Sixth year. 16 hours. ROTHROCK.
- 111a,b. GYNECOLOGICAL CLINIC. Bedside studies in diagnosis and treatment of diseases of women. City and County Hospital, St. Paul. Fifth and sixth year. Limited to four students. 12 hours. JONES.
- 113a,b. CLINIC IN GYNECOLOGY AND OBSTETRICS. Bedside clinic at the Minneapolis City Hospital. Fifth or sixth year. Four students. 12 hours. MALAND.
115. CLINIC IN GYNECOLOGY AND OBSTETRICS. Course same as III. SIMONS.
117. APPLIED ANATOMY OF THE PELVIS. Fifth year. Eight hours. LAVAKE.

THE DEPARTMENT OF PEDIATRICS

Professor JULIUS PARKER SEDGWICK; Associate Professor WALTER R. RAMSEY; Assistant Professor FREDERIC W. SCHLUTZ; Instructors BRONSON CROTHERS, EDGAR J. HUENEKENS, FREDERICK C. RODDA; Assistants WILLIAM D. BEADIE, TOBIAS L. BIRNBERG, JOSEPH A. HEDDING, RALPH T. KNIGHT, HENRY A. LYSNE; CHARLES E. SMITH, JR.; Teaching Fellows ROOD TAYLOR, NABOTH O. PEARCE.

Departmental Office, Millard Hall

REQUIRED COURSES

- 101-102. DISEASES OF CHILDREN. The etiology, pathology, diagnosis and treatment of diseases peculiar to, or distinctive of children, with particular emphasis upon their differences from adult type. Fifth year. 56 hours. SEDGWICK, RAMSEY.
- 102a,b. CLINIC IN PEDIATRICS. Conducted at the University Hospitals, the Minneapolis City Hospitals, Lymanhurst, and the City and County Hospital, St. Paul. Sections of class, fifth year. 16 hours. SEDGWICK, SCHLUTZ, RAMSEY, HUENEKENS, RODDA, and Assistants.
- 103a,b. CLINIC IN CONTAGIOUS DISEASES. Conducted in the Minneapolis City Hospital and the City and County Hospital, St. Paul. Sections of class, fifth year. 16 hours. RAMSEY, HUENEKENS, RODDA, and Assistants.
- 104a,b. CLINIC IN PEDIATRICS. An advanced clinical course, conducted at the University Hospital and affiliated hospitals. Sections of class, sixth year. 8 hours. SEDGWICK, RAMSEY, SCHLUTZ, RODDA, HUENEKENS, TAYLOR.
- 105a,b. OUTPATIENT PEDIATRIC CLINIC. The practical study of the diseases of children in the Outpatient service. Sections of class, sixth year. 12 hours. SCHLUTZ, HUENEKENS, TAYLOR, and Assistants.

ELECTIVE COURSES

- III. DISEASES OF THE NEW-BORN. The pathology and treatment of these disorders, with the presentation of illustrative cases. Limited to six students. Fifth or sixth year. 16 hours. SEDGWICK, TAYLOR.
- II2. NERVOUS DISEASES OF CHILDREN. The functional nervous disorders of childhood, with the observation and practice of electrical reactions in normal and abnormal children. Limited to six students. Fifth or sixth year. 16 hours. SEDGWICK.
- II3. CONTAGIOUS DISEASES. The advanced study of contagious diseases, including the practice of intubation and tracheotomy, with training upon the cadaver. Fifth or sixth year. 16 hours. RAMSEY.

114. COURSE IN INFANT FEEDING. Conducted at the St. Paul Baby Welfare Clinic of the H. Amherst Wilder Charity. Sixth year. 24 hours. RAMSEY.
- 115a,b. THEORY AND PRACTICE OF INFANT FEEDING, INCLUDING DISEASES OF THE GASTRO-INTESTINAL TRACT. Limited to six students. In first three quarters, sixth year; in fourth quarter, fifth year. 8 hours. SCHLUTZ.
- 117a,b. CONGENITAL DEFECTS AND CONSTITUTIONAL DISORDERS OF INFANCY AND CHILDHOOD. Limited to six students. In each quarter. Fifth or sixth year. 8 hours. SCHLUTZ.
- 119a,b. INFANT FEEDING. A course of study conducted at the Pillsbury Settlement House. Limited to four students. Sixth year. 8 hours. HUENEKENS.
- 121a,b. PEDIATRIC CLINIC, OUTPATIENT DEPARTMENT. Limited to six students. Fifth or sixth year. 36 hours. HUENEKENS, SCHLUTZ, RODDA, TAYLOR.
123. SYPHILIS IN CHILDREN. Conducted at the Outpatient Department and at the University Hospital. Limited to four students. Fifth or sixth year. 8 hours. SEDGWICK, TAYLOR.
- 125a,b. CLINIC IN CONTAGIOUS DISEASES. Conducted at the Minneapolis City Hospital. Limited to four students. Sixth year. 16 hours. SCHLUTZ.
- 127a,b. CLINIC IN CONTAGIOUS DISEASES. Conducted at the City and County Hospital, St. Paul. Limited to ten students. Course repeated in each quarter. Fifth or sixth year. 12 hours. RAMSEY, BIRNBERG.

DEPARTMENT OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

Professor FRANK C. TODD; Associate Professor WILLIAM R. MURRAY; Assistant Professors FRANK E. BURCH, JOHN S. MACNIE, HORACE NEWHART; Instructors HOWARD S. CLARK, WILLIAM W. LEWIS, FRED J. PRATT; Assistants WALTER E. CAMP, CHARLES W. FOGARTY, JOHN W. LEE, EARL A. LOOMIS, THOMAS J. MALONEY, MARGARET I. SMITH, H. JOURNEY WELLES; Teaching Fellows CHARLES E. CONNOR, SAMUEL T. FORSYTHE; Graduate Scholars HENRY J. FRIESEN, ERLING W. HANSEN, ARTHUR E. MARK, MILLARD F. SMITH.

Departmental Office, Millard Hall

REQUIRED COURSES

79. OPHTHALMOLOGY AND OTOTOLOGY. Disorders and diseases of the eye

and ear and their corrective, medical, and surgical treatment. Sixth year. 32 hours. TODD.

81. RHINOLOGY AND LARYNGOLOGY. The diagnosis and treatment of diseases of the nose and throat. Sixth year. 16 hours. MURRAY.
- 83a,b. SECTION CLINICS IN EYE, EAR, NOSE, AND THROAT. Diagnostic and operative procedures in the clinics of the University Hospital, the Minneapolis City Hospital, and the City and County Hospital, St. Paul. Sixth year. 28 hours. TODD, BURCH, MURRAY, LEWIS.
- 85a,b. SECTION CLINIC IN DISEASES OF THE EYE. Study and treatment of cases in the Outpatient service. Sixth year. 12 hours. MACNIE, CLARK, and Assistants.
- 87a,b. SECTION CLINIC IN DISEASES OF THE EAR. Study and treatment of cases in the Outpatient service. Sixth year. 12 hours. NEWHART and Assistants.
- 89a,b. SECTION CLINIC IN DISEASES OF THE NOSE AND THROAT. Study and treatment of cases in the Outpatient service, at three weekly sessions. Sixth year. 12 hours. MURRAY, PRATT, and Assistants.

ELECTIVE COURSES

- 115a,b. CLINIC IN DISEASES OF THE EYE. The examination of patients, diagnosis of disease conditions and supervised treatment. Alternate days, in the Outpatient Department. Sixth year. 36 hours. MACNIE and Assistants.
- 117a,b. CLINIC IN DISEASES OF THE EAR. Studies in examination of cases, diagnosis, and supervised treatment. Alternate days, at the Outpatient Department. Sixth year. 12 hours. NEWHART and Assistants.
- 119a,b. CLINIC IN DISEASES OF THE NOSE AND THROAT. The examination of patients, diagnosis of disease conditions and supervised treatment. Alternate days, at the Outpatient Department. Sixth year. 24 hours. MURRAY, PRATT, and Assistants.
- 121a,b. OPERATIVE CLINICS IN EYE, EAR, NOSE, AND THROAT. Conducted at the University Hospital. Course repeated in each quarter. Limited to ten students. Sixth year. 16 hours. TODD, BURCH, CLARK.
123. REFRACTION. A course of lectures. Required of all desiring the practical course 125a,b. Sixth year. 8 hours. BURCH.
- 125a,b. PRACTICAL COURSE IN REFRACTION. Limited to ten students. Prerequisite: Course 123. Sixth year. 36 hours. BURCH, LOOMIS.
126. OPHTHALMOSCOPY. The principles and practice of this method of examination of the eye. Sixth year. 16 hours. MACNIE, CLARK.

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1918/19

The Bulletin of the University of Minnesota

*The Medical School
Announcement for the Year
1918 - 1919 ✓*

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UNIVERSITY CALENDAR

1918-1919

1918

September	11	Wednesday	Registration closes except for new students
September	11-18	Week	Fees payable except for new students
September	17-24	Week	Examinations for removal of conditions and entrance examinations
September	23-24		Registration and payment of fees for new students
September	25	Wednesday	First semester begins
October	17	Thursday	Senate meeting, 4:00 p.m.
November	5	Tuesday	General Election Day; a holiday
November	20	Wednesday	Medical School second quarter begins
November	27	Wednesday	Thanksgiving recess begins 9:00 p.m.
December	2	Monday	Thanksgiving recess ends 8:00 a.m.
December	21	Saturday	Christmas vacation begins 12 m.

1919

January	2	Thursday	Christmas vacation ends 8:00 a.m.
January	2	Thursday	School of Embalming begins
January	20	Monday	Second semester registration closes except for new students
January	27	Monday	Final examinations begin
January	27	Monday	Payment of second semester fees closes except for new students
January	31	}	Registration and payment of fees for new students
February	1		
February	3	Monday	Second semester begins
February	12	Wednesday	Lincoln's Birthday; a holiday
February	20	Thursday	Senate meeting, 4:00 p.m.
February	22	Saturday	Washington's Birthday; a holiday
March	31	Monday	Medical School fourth quarter begins
April	17	Thursday	Easter recess begins 9:00 p.m.
April	22	Tuesday	Easter recess ends 8:00 a.m.
April	22-28	Week	Condition examinations in certain colleges
May	15	Thursday	Senate meeting, 4:00 p.m.
May	23	Friday	Final examinations begin 2:00 p.m.
May	30	Friday	Memorial Day; a holiday
May	31	Saturday	Second semester closes
June	1	Sunday	Baccalaureate service
June	2	Monday	Senior Class Day exercises
June	4	Wednesday	Alumni Day
June	5	Thursday	Forty-seventh Annual Commencement
June	6	Friday	Summer vacation begins
June	16	Monday	Summer Session begins

The University year for 1919-20 will begin Tuesday, September 16.
Classes will begin September 24.

THE MEDICAL SCHOOL

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FREDERICK H. SCOTT, Ph.D., M.B., D.Sc., Member-Elect, Representing the Faculty

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C. EUGENE RIGGS, M.A., M.D., Emeritus Professor of Mental and Nervous Diseases 10 Crocus Hill, St. Paul
THOMAS S. ROBERTS, M.D., Emeritus Professor of Pediatrics 2303 Pleasant Ave.

-
- FRED L. ADAIR, M.D., Associate Professor of Obstetrics and Gynecology
730 LaSalle Building

- *LOUIS B. BALDWIN, M.D., Superintendent of University Hospitals

* On military service.

- HARRY G. IRVINE, M.D., Assistant Professor in Dermatology and Syphilis
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1115 S. E. 5th St.
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of the Division
707 Donaldson Bldg.
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3305 2nd Ave. S.

-
- *JOHN S. ABBOTT, M.D., Instructor in Surgery
- JOHN M. ARMSTRONG, M.D., Instructor in Dermatology and Syphilis
1040 Lowry Bldg., St. Paul
- *J. FOWLER AVERY, M.D., Instructor in Medicine
- *ARCHIBALD H. BEARD, M.D., Instructor in Medicine

* On military service.

- *J. WARREN BELL, M.D., Instructor in Obstetrics and Gynecology
 ANNE G. BENTON, B.A., Instructor in Pathology and Bacteriology 2024 Queen Ave. S.
 PAUL D. BERRISFORD, M.D., Instructor in Pathology 1004 Lowry Bldg., St. Paul
 TOBIAS L. BIRNBERG, M.D., Instructor in Pediatrics 1035 Lowry Bldg., St. Paul
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 *WALTER E. CAMP, M.D., Instructor in Ophthalmology and Oto-Laryngology 910 Donaldson Bldg.
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* On military service.

- FRED J. PRATT, M.D., Instructor in Ophthalmology and Oto-Laryngology
328 Hennepin Ave. E.
- JOHN A. PRATT, M.D., Instructor in Ophthalmology and Oto-Laryngology
328 Hennepin Ave. E.
- ROBERT I. RIZER, M.D., Instructor in Medicine 824 LaSalle Bldg.
- FREDERICK C. RODDA, M.D., Instructor in Pediatrics
614 Syndicate Bldg.
- *WILLMAR C. RUTHERFORD, M.D., Instructor in Obstetrics and Gynecology
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1020 Donaldson Bldg.
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506 Physicians and Surgeons Bldg.
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741 Lowry Bldg., St. Paul
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Glen Lake, Minn.
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- MARGARET WARWICK, M.D., Instructor in Pathology and Bacteriology
1516 S. E. 7th St.
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1042 Metropolitan Bank Bldg.
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- MILDRED ZIEGLER, B.A., Instructor in Pediatrics 1616 S. E. 7th St.
- *HARRY B. ZIMMERMAN, M.D., Instructor in Surgery

TEACHING ASSISTANTS

- EDWARD D. ANDERSON, B.A., Assistant in Physiology 215 Groveland Ave.
- ELIZABETH M. BARNARD, M.D., Assistant in Obstetrics and Gynecology
730 LaSalle Bldg.
- *WILLIAM D. BEADIE, M.D., C.M., Assistant in Pediatrics
- LOUISA M. BOUTELLE, M.D., Assistant in Medicine City Hospital
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- LOUIS E. DAUGHERTY, M.D., Assistant in Surgery
914 Lowry Bldg., St. Paul
- *EDWARD J. ENGBERG, M.D., Assistant in Nervous and Mental Diseases
- WALTER A. FANSLER, M.D., Assistant in Medicine and Surgery
100 Andrus Bldg.

* On military service.

- FRANCES A. FORD, B.S., Research Assistant in Medicine
245 Irving Ave. N.
- CHARLES C. GAULT, B.A., Assistant in Physiology 1915 Hennepin Ave.
- *WALTER E. GREMPER, M.D., Assistant Resident Physician
- WILLIAM A. GREY, D.D.S., Research Assistant in Mouth Infections
923 Lowry Bldg., St. Paul
- ROBERT S. GUTSELL, B.A., Assistant in Anatomy 652 S. E. Erie St.
- *CHARLES A. HALLBERG, M.D., Assistant in Surgery
- ARNOLD L. HAMEL, M.D., Assistant in Surgery
- *JAMES F. HAMMOND, M.D., C.M., Assistant in Obstetrics
- CLARENCE HERMANN, D.D.S., Assistant in Dental Diseases
1600 Western Ave.
- SIEGFRIED F. HERRMANN, B.S., Assistant in Pathology and Bacteriology
329 S. E. Union St.
- KANO IKEDA, M.D., Assistant in Medicine 4856 Washburn Ave. S.
- *E. MENDELSSOHN JONES, M.D., Assistant in Obstetrics and Gynecology
544 Lowry Bldg., St. Paul
- HUGH T. JONES, B.S., Assistant in Pathology and Bacteriology
500 S. E. Delaware St.
- M. KELLER KNAUFF, M.D., Assistant in Orthopedic Surgery
942 Lowry Bldg., St. Paul
- ALFRED E. LANGE, B.S., Assistant in Pharmacology 329 S. E. Union St.
- JOHN A. LEPAK, B.S., Assistant Resident Physician University Hospital
- EARL A. LOOMIS, M.D., Assistant in Ophthalmology and Oto-Laryngology
203 Donaldson Bldg.
- ERNEST S. MARIETTE, M.D., Assistant in Medicine Glen Lake Sanatorium
- GLENN R. MATCHAN, M.D., Assistant in Pediatrics 312 Masonic Temple
- *JOSEPH C. MICHAELS, M.D., Assistant in Nervous and Mental Diseases
- HENRY E. MICHELSON, M.D., Assistant in Dermatology and Syphilis
707 Donaldson Bldg.
- *FREDERICK P. MOERSCH, M.D., Assistant in Nervous and Mental Diseases
- RUSSELL W. MORSE, B.S., Assistant in Anatomy 3244 Clinton Ave.
- ORVILLE N. NELSON, B.A., Assistant in Pathology and Bacteriology
711 Washington Ave. S. E.
- NIELS NEDERGAARD, M.D., Assistant in Medicine 723 10th Ave. S.
- *HARRY R. NORDLEY, M.D., Assistant in Medicine
- CHARLES A. OLSON, M.D., Assistant in Pediatrics
1035 Arkwright St., St. Paul
- FREDERICK A. OLSON, M.D., Assistant in Surgery 420 Syndicate Bldg.
- *MANFORD O. OPPEGAARD, M.D., Assistant in Surgery
- NABOTH O. PEARCE, M.D., Assistant in Pediatrics 1056 13th Ave. S. E.
- EMIL C. ROBITSHEK, M.D., Assistant in Surgery
506 Physicians and Surgeons Bldg.
- BYRON L. ROBINSON, B.A., Assistant in Anatomy 505 S. E. Walnut St.
- ROY E. ST. CLAIR, B.A., Assistant in Anatomy 423 S. E. Oak St.

* On military service.

- CLIFFORD G. SALT, B.S., Assistant in Physiology 329 S. E. Oak St.
 FREDERICK H. K. SCHAAF, M.D., Assistant in Medicine 414 Syndicate Bldg.
 JOHN H. SCHROEDER, M.D., Assistant in Dermatology 1042 Metropolitan Bank Bldg.
 FAUS P. SILVERNALE, Ph.D., Assistant in Anatomy 1013 24th Ave. S. E.
 HARVEY M. SLATER, M.D., Assistant in Medicine Auditorium Bldg.
 ARTHUR E. SMITH, M.D., Assistant in Ophthalmology and Oto-Laryngology 1016 Donaldson Bldg.
 ALBERT M. SNELL, B.S., Assistant in Physiology 509 Washington Ave. S. E.
 FREDERICK J. SOUBA, M.D., Assistant in Obstetrics and Gynecology 1007 Donaldson Bldg.
 G. ELMER STROUT, M.D., Assistant in Ophthalmology and Oto-Laryngology 910 Donaldson Bldg.
 *GILBERT J. THOMAS, M.D., Assistant in Urology
 CLYDE A. UNDINE, M.D., Assistant in Medicine 632 Syndicate Bldg.
 EUGENE F. WARNER, M.D., Assistant in Pediatrics 242 Lowry Bldg., St. Paul
 H. JOURNEY WELLES, M.D., Assistant in Ophthalmology and Oto-Laryngology 307 Masonic Temple
 DANIEL E. ZISKIN, D.D.S., Assistant in Dental Diseases 1600 Plymouth Ave. N.

TEACHING FELLOWS

- ALBERT G. ALLEY, M.D., in the Department of Pediatrics 2002 Lake of Isles Blvd.
 WINIFRED M. ASHBY, M.A., in the Department of Medicine 703 S. E. Delaware St.
 LEE W. BARRY, M.D., in the Department of Obstetrics and Gynecology 609 S. E. Oak St.
 *GORDON CLARK, M.D., in the Department of Obstetrics and Gynecology
 LEROY A. CALKINS, B.S., in the Department of Obstetrics and Gynecology
 EARL CRAFTS, M.D., in the Department of Surgery 512 S. E. Delaware St.
 *FLOYD GRAVE, M.D., in the Department of Medicine
 FRANK N. KNAPP, M.D., in the Department of Ophthalmology and Oto-Laryngology 930 Lowry Bldg., St. Paul
 VICTOR L. LANGENDERFER, in the Department of Ophthalmology and Oto-Laryngology 515 5th Ave. S. E.
 CHARLES E. NIXON, M.D., in Nervous and Mental Diseases 509 Washington Ave. S. E.
 *HJALMAR L. OSTERUD, B.A., in the Department of Anatomy 652 S. E. Erie St.

* On military service.

*HENRY P. WAGENER, M.D., in the Department of Ophthalmology and Otolaryngology

ANNA B. YATES, B.A., in the Department of Physiology 1316 S. E. 7th St.

MEMBERS OF OTHER FACULTIES GIVING INSTRUCTION TO MEDICAL STUDENTS

IRA HARRIS DERBY, Ph.D., Assistant Professor of Chemistry

2157 Commonwealth Ave., St. Paul

HAL DOWNEY, Ph.D., Professor of Animal Biology 802 S. E. 4th St.

WILLIAM H. HUNTER, Ph.D., Associate Professor of Chemistry

507 S. E. Essex St.

HENRY F. NACHTRIEB, B.S., Professor of Animal Biology

905 S. E. 6th St.

CHARLES P. SIGERFOOS, Ph.D., Professor of Animal Biology

1023 University Ave. S. E.

CARL L. SCHUMAN, Ph.D., Instructor in Chemistry

317 17th Ave. S. E.

* On military service.

GENERAL INFORMATION

The thirty-first annual course of study in the Medical School begins Tuesday, September 17, 1918, and covers a period of nine months. The summer session opens June 16, 1919.

REQUIREMENTS FOR ADMISSION TO THE MEDICAL SCHOOL

At least two years, or sixty credits, earning sixty honor points, of prescribed and elective study in the College of Science, Literature, and the Arts of this University or of any other approved institution are required for admission to the Medical School. The prescribed academic studies preliminary to medicine are: rhetoric, six credits; physics, eight credits; general chemistry and qualitative analysis, and organic chemistry, twelve to eighteen credits; biology, six credits; and a reading knowledge of French or German.

High-school or college Latin and psychology are recommended as studies preparatory to medicine.

This two or more years of collegiate study must lead, upon the satisfactory completion of one or two years of medical study, earning sixty credits and sixty honor points, to the Baccalaureate degree in science or in arts. Students holding the Bachelor's degree of any recognized college may submit credentials of practical equivalence in cultural studies, provided an adequate knowledge of biology, chemistry, and physics has been attained, and a reading knowledge of French or German demonstrated.

REGISTRATION

Registration is conducted under general University rules, in the office of the Registrar and is reported to the office of the Dean of the Medical School. Students will interview the Students' Work Committee for classification and arrangement of courses. Students will not be permitted to register later than the tenth day from the opening of the semester, unless exceptional causes of delay are presented and are accepted by the Students' Work Committee.

On account of the present limited capacity of the Medical School, the registration of incoming (third year) classes has been limited to ninety. All applicants for admission will fill out and submit to the Dean's office an application form. These applications should be entered as soon as the candidate's entrance requirements are completed. If preparatory work has been done elsewhere than at the University of Minnesota application must be accompanied by certified credentials of high-school and college courses.

The Students' Work Committee will meet to consider applicants for admission at 9 a.m. on June 5, July 2, and August 1, 1918. A personal

interview is required. Recommendations as to personal fitness, preparation, etc., must be submitted, with credentials.

Candidates will be selected with reference (a) to their full compliance with credit requirements; (b) to the quality of their preparatory work; (c) to their general knowledge; and (d) to their personal fitness. They will be submitted to competitive examinations as an aid in determining their comparative merits. These examinations will be held upon the dates given above. They will include tests of mental ability and general information. A physical examination is required.

Holders of the degree of B.A. or B.S. who have covered the required subjects, and those who have successfully completed two or three years of collegiate work, including full credits and required subjects, will be entitled, other things being equal, to first consideration for existing vacancies at the date of their application.

All other qualifications being equal, residents of Minnesota will be given prior opportunity in any vacancies existing at the date of their application. Only under exceptional circumstances will entrance conditions be permitted and, if allowed, they must be removed invariably before the opening of the succeeding school year.

FEEES

The annual tuition fee in the Medical School is \$150, payable in two installments, at the opening of the first and second semesters. No tuition fee is charged for the final hospital or advanced year, which is now requisite to the degree.

A health service is to be provided in the University, and the Board of Regents has directed that a health fee of \$3.00 per semester be paid by each student.

A deposit of \$10 in the first year, and of \$5 in succeeding years, is required as a caution fee. This fee covers the cost of unnecessary damage to school buildings, of breakage and loss of laboratory apparatus and material, penalties for late registration or late payment of fees, fees for condition examinations, and rentals of post-office box and lockers. Any balance remaining from this deposit will be returned to the student at the close of each year.

Students taking less than the regular course may arrange their fees upon a scale of \$3 for each semester-hour's work.

Repetition of work in course demands the repetitional payment of fees.

A fee of \$1 is payable for condition examinations; and one of \$5 for special examinations.

A fee of \$1 is required for attendance of students upon the clinical service of the City and County Hospital of St. Paul.

MICROSCOPES

Students must provide themselves, by purchase or rental, with a microscope of approved quality and equipment. They may arrange with

the Assistant Dean for purchase of microscopes, through the University, upon cash payment or installment plan. Microscopes of suitable type range, at the present time, from \$81 upwards.

COMBINED COURSES IN ARTS AND MEDICINE

Students who are candidates for the degree of Bachelor of Arts, who have successfully completed three years, or ninety credits, of work, fifteen credits being in starred courses, and who have won the required number of honor points in the College of Science, Literature, and the Arts, may elect their fourth year in the Medical School and secure the remaining thirty credits and the remaining thirty honor points required for the Baccalaureate degree, in that school.

Similarly, students who have completed, with the required number of honor points, the work of the first two years, or sixty credits, in the College of Science, Literature, and the Arts, may enter the Medical School and upon the successful conclusion of two years work, with the required sixty credits and sixty honor points, will receive the degree of Bachelor of Science.

Students who have not received the B.A. or B.S. degree will be ineligible to registration in the fifth year of the combined course.

Those who have received the B.A. or the B.S. degree before entering the Medical School must earn, nevertheless, a minimum of sixty honor points in the first two years of medical study. This is the equivalent of an average grade of C.

It will be understood that in either of these combined courses the required subjects, viz.: rhetoric, chemistry, biology, physics, and a reading knowledge of French or German, must be included.

THE CURRICULUM

Within the four years of study in the Medical School, students have a total of 4,200 hours of required and elective work. These hours are distributed as follows:

Subject	Hours	Subject	Hours
Anatomy	688	Medicine, including Medical Juris-	
Physiology	416	prudence	416
Physical Chemistry.....	96	Surgery	232
Pathology	392	Obstetrics	160
Bacteriology	168	Pediatrics	56
Pharmacology	136	Ophthalmology and Oto-Laryngology	48
Hygiene	32	Clinics and Clerkships.....	784
		Electives	576

ELECTIVE STUDIES

Elective courses are offered in the fourth, fifth, and sixth years. These are listed under Departmental Statements.

Certain approved courses in animal biology, chemistry, etc., taught in other units of the University than the Medical School, may be taken as electives by medical students. These, also, are to be found in the departmental statements.

The general arrangement of studies is planned for the average student of medicine. The order of studies is not absolutely fixed. As wide a range of individual freedom is permitted as may prove consistent with systematic education. The Committee on Students' Work has authority, within due bounds of sequence of subjects, to adjust a student's program to his particular preparation, needs, and abilities. This liberty is not intended to suggest any departure from acknowledged standards.

MIGRATORY STUDENTS

Students migrating from recognized medical schools will present to the Registrar their official credentials of admission requirements, which must be equivalent to those of this School. They will submit to the Students' Work Committee time and subject credits in medicine. They will present to the head of each department, in which they seek exemption or advanced standing, notebooks and records of scholarship in each subject. These may be accepted as of full value or may be supplemented by review examination, or by additional work at the discretion of the department. Subject credit, but not time credit, may be given for work done other than in a medical school. Special work will be arranged for students taking such subject credits to fill the full period required by law in medical study.

No advanced standing entitles the student to take two years of any graded study coincidently.

CLINICAL SERVICE

Attendance upon clinics is required. Senior's are assigned to clinical clerkships in the University Hospital. As clinical clerks they are under the supervision of senior interns or Teaching Fellows, who will assign them to duty. Clinical clerks will record physical examinations, make and record laboratory investigations, and will attend hospital rounds and general clinics. Patients will be examined by clinical clerks only at the direction of the attending clinician.

EXAMINATIONS

The standing of students is determined by recitations, oral or written examinations, and review of laboratory or clinical notebooks. Examinations are usually held at the end of each semester upon the courses closed within that period. Final standings are determined at the close of each semester in conference of the heads of departments with the Students' Work Committee. Reports of such standings are filed in, and announced by the Registrar's Office.

A uniform marking system is operative throughout the University. Four passing grades, indicated by the symbols A, B, C, and D, represent differing degrees of merit. While a grade of D passes a student in an individual course, not less than an average of C is regarded as satisfactory work. The symbol E represents a condition, which may be removed by examination and by such supplementary work as the department imposing it may require. F stands for a failure and calls for a repetition of the work in class. I stands for incomplete and grants the student further time for the completion of the required work.

CONDITIONS

It is incumbent upon the student to remove a condition at the first opportunity offered. If not so removed it becomes a failure.

Examinations for the removal of conditions and for advanced standing are held at the opening of the school year, from September 17 to 24, 1918. Schedule of examinations may be had upon request.

An opportunity for the removal of first-semester conditions will be given at the Easter recess.

Any student, who, at the end of any given semester, receives grades of E or F in more than 50 per cent of his registered work in that semester, will be indefinitely dropped for poor scholarship; such percentage to be estimated upon a credit hour basis. Any student so dropped will not be eligible to condition examination or to reinstatement excepting upon recommendation of the Students' Work Committee and affirmative vote of the Administrative Board.

REQUIREMENTS FOR GRADUATION

Compliance with the admission requirements; the prior attainment of the degree of Bachelor of Arts or Bachelor of Science, to which one year in medicine for the arts degree, and two years in medicine for the science degree, may contribute; the completion of the full four-year period of required and elective work in the Medical School; a thesis presented at the close of the senior year; an approved hospital internship or advanced laboratory work or public health study for one year; and an unimpeached moral character, are the essentials for graduation.*

The required internship insures to the practitioner of medicine a year of varied clinical experience under competent supervision and gives to the public a greater assurance of efficiency in the graduate. The alternative of advanced laboratory work serves to encourage men and women of training who desire to enter the profession of medical teaching. The alternative of public health study meets a growing demand for trained medical sanitarians.

* For the period of the war, the degree of Bachelor of Medicine will be given upon the satisfactory completion of the four full years of medical study; the degree of Doctor of Medicine upon the certified completion of the required and approved hospital internship of one year's duration.

CLINICAL OPPORTUNITIES

THE UNIVERSITY HOSPITALS

The University is fortunate in the ownership and control of the University Hospital service. The Elliot Memorial Building, the product of a bequest of the estate of the late Dr. and Mrs. A. F. Elliot, supplemented by legislative appropriations, provides a present clinic of 192 beds.

The University Hospital system seeks the highest attainable results in the treatment of patients and the training of students. Its clinical service is closely coöperative with the laboratory departments. Its service is free and patients are admitted only upon the certificate of physicians of the state vouching for the applicant's inability to pay ordinary hospital charges and physician's fees, and stating the clinical character of the case.

A service building provides kitchens, dining-rooms, storerooms and quarters for domestic help.

The Outpatient Department of the University Hospitals is housed in Millard Hall. Its service is open to free patients and is conducted by the clinical staff of the Faculty of the Medical School. It is subdivided into medical, surgical, gynecological, obstetrical, children's, eye, ear, nose and throat, skin, syphilis, genito-urinary, nervous and mental, and orthopedic clinics. It enrolled 15,830 new patients and received 55,997 patients' visits during the past year.

Sections of the senior and junior classes are assigned to these clinics daily and are trained in case-history taking, physical examinations and diagnosis, in prescription writing, and in general therapeutic methods.

A Clinical Pathological Conference is held weekly in which the history and clinical manifestations and the gross and microscopic features of cases coming to autopsy are discussed. Members of the Faculty and students are invited to participate.

THE SOCIAL SERVICE OF THE UNIVERSITY HOSPITALS

A Social Service Department has been established in relation to the hospital system and its outpatient clinics. In addition to the economic values it brings to the clinical service and the benefits which hospital and dispensary patients derive from a trained supervision extending to their homes, it offers opportunities of field work and social study to medical and sociological students.

AFFILIATED HOSPITALS

The Minneapolis City Hospitals and the City and County Hospitals of St. Paul are closely affiliated with the Medical School of the University. One half of their clinical service is under the direction of the Faculty. Attending and consulting staffs are appointed annually upon the recommendation of the Administrative Board of the School.

The combined resources of these two hospitals cover some 1,400 beds. Every phase of clinical service is represented and clinical material is utilized, so far as possible, by the School.

The State Hospital for the Crippled and Deformed, at Phalen Park, invites the Medical School to full participation in its clinical opportunities. Its superintending surgeon and his aides are members of the Faculty. Teaching Fellows and interns of the University Hospital are assigned in rotation to its service. It provides weekly clinics for divisions of the senior class.

Additional clinics are held in other institutions, as the Pillsbury House, the Glen Lake Sanitorium, and the St. Paul Free Dispensary.

LIBRARY

The library of the Medical School consists of the General Library, housed in Millard Hall, and of collections of books in the departmental libraries of Surgery, Obstetrics, Anatomy, and Pathology and Bacteriology. These departmental collections are readily available to students and investigators. The General Library is open from 9 a.m. to 10 p.m. Some 200 current journals are on file; 15,850 bound volumes and 32,859 unbound volumes and monographs, etc., are cataloged.

The libraries of other schools and colleges in the University and of the Hennepin County and Ramsey County Medical Societies are accessible to students of medicine.

PRIZES, FELLOWSHIPS, AND ASSISTANTSHIPS

The Rollin E. Cutts Prize in Surgery.—Dr. Martha Smith Cutts, '91 medical, established, some years ago, as a memorial to her husband, the late Dr. Rollin E. Cutts, a fund of \$500, the income of which is awarded, in the form of a gold medal, to the member of the senior class of the Medical School who presents the best thesis evidencing original work upon an approved surgical subject.

The Shevlin Fellowship.—A fellowship, representing the income of \$10,000, established in the Graduate School by the late Thomas H. Shevlin, is open to candidates for one full year's work in acceptable medical research. This fellowship has been held during the past year by Martin B. Ott, B.A.

Several student assistantships and, occasionally, fellowships in the fundamental departments, offer varying stipends.

THE WAR SERVICE OF THE MEDICAL SCHOOL

Early in the past year, the President of the United States provided regulations under which bona fide medical students of the second, third, and fourth years in medicine and hospital internes (representing the fourth, fifth, sixth, and seventh years of the combined course in this School) who

are successfully maintaining their courses of study, may apply for discharge from the National Army, and, having physically qualified, may enlist in the Enlisted Reserve of the Medical Department under the direction of the Surgeon General. Later, the Government extended this opportunity to matriculants of the first (third) year and to medical students under or over draft age.

Students, so enlisted, are placed on inactive status for the continuance of their studies, subject to call to active medical service at the need of the Government. At the close of their interne year they are eligible for commissions in the United States Army or Navy Medical Reserve Corps.

The Surgeon General has expressed his intention to permit of the completion of a year's internship before a commission is granted, but the Government holds itself free to abrogate this privilege if necessary.

It is clearly understood that the retention of the student in inactive service depends upon the successful pursuit of his studies and his continuing progress from one year to another in the course. The clear purpose of these regulations is not the exemption of the medical student, but his fit preparation for the practice of his profession and for the best service that he can render to the country. It should serve as a stimulus to the best work of which the student is capable.

It is possible that the Surgeon General may ask the medical schools of the country to maintain a continuous session throughout the year; but of the wisdom of this course he is not at present assured.

As an added contribution to the war service, the University has undertaken the intensive training of naval hospital corps men, in detachments of one hundred each, for periods of four months. Three such detachments have been entered and have taken courses of instruction in anatomy, physiology, physiologic chemistry, bacteriology, pharmacology, first aid measures, hospital ward procedures and dietetics.

THE SUMMER SESSION

A summer session of six weeks' duration almost immediately follows the commencement exercises in June. The courses in this session are conducted in the laboratories and lecture halls of the Medical School, in the Hospitals and in the Outpatient Department.

Undergraduates in medicine are admitted in the Summer Session to courses of study offered for the following purposes: (1) to secure advanced standing in courses equivalent to those of the regular session; (2) to compensate for deficiencies in studies taken in other acceptable schools; (3) to remove conditions or failures in subjects which are equivalently covered in these courses.

For courses of instruction offered and schedule of tuition fees see circular of information of the Summer School.

THE GRADUATE SCHOOL IN MEDICINE

The Graduate School in Medicine has been established as a part of the main Graduate School of the University. It offers to suitably prepared graduates in medicine, courses covering two and three years, leading to the degree of Master of Science, Doctor of Philosophy, or Doctor of Science. The adequate training of specialists in medicine is one of the main purposes of the school and for this purpose, teaching fellowships, under annual stipends, have been created; with an additional number of graduate scholarships, under an abatement of tuition fees, to which selected graduate students receive appointment. Still other graduate students in medicine may be received under an annual tuition fee of \$50.

The field of graduate teaching in medicine has been extended to the inclusion of the opportunities for graduate study and medical research offered by the Mayo Foundation for Medical Education and Research, established at Rochester, Minnesota. Fellows and graduate scholars are assigned to courses of study both at the University and in the Foundation.

Students in the Medical School who have received the Baccalaureate degree from this or any other approved University may become candidates for the degree of Master of Arts, Master of Science, or Doctor of Philosophy in the Graduate School. They will pursue courses of study conforming to the regulations of the Graduate School.

Students registered in the Graduate School may elect majors or minors for the graduate degrees, for which advanced courses are provided, in anatomy, embryology, histology, neurology, pathology, bacteriology, physiology, physiologic chemistry and pharmacology, in the Medical School.

In all cases, students must comply with the rules and regulations of the Graduate School of the University of Minnesota, further information of which may be found in the Announcement of the Graduate School, or in the Circular of Information on graduate work in medicine. Application blanks for teaching fellowships and scholarships may be had upon request.

OPPORTUNITIES OF STUDY FOR PHYSICIANS

Physicians who desire to attend medical lectures and clinics for a limited period of time may obtain a visitor's ticket from the Dean. They may enter for regular lecture and clinical courses in the Medical School upon payment of a fee of \$10 for each semester. They may arrange for special courses of study in anatomy, physiology, experimental surgery, pathology, bacteriology, pharmacology, etc., at a fee varying from \$15 to \$30 for each full semester's course, with additional charge for material used.

The School announces the semi-annual opportunity of Physicians' Clinic Days, during which a full program of clinics in the University Hospital, the outpatient service, and the allied municipal hospitals will

be presented. Circulars of information of these occasions will be distributed.

THE SCHOOL FOR NURSES

The School for Nurses is a department of University instruction under the control of the Medical School. It is conducted in connection with the University Hospitals. It is in charge of a Superintendent, assisted by a committee of management and by a teaching staff selected from the Faculty of the Medical School. While the undergraduates of the School for Nurses constitute in part the nursing corps of the University Hospitals, the School exists primarily for the efficient education of the nurse. It is the first school for nurses in the United States organized under direct university control.

A four years' high-school course is the minimal requirement for admission. A six months' preliminary course in foundational studies is given before entry to the hospital service. The full course covers a period of three years. It leads to the degree of Graduate in Nursing conferred, upon the recommendation of the Faculty, by the Board of Regents.

Nurses in training are received from certain affiliated hospitals for the completion of their courses of study.

For further information, see Bulletin of the School for Nurses.

THE SCHOOL OF EMBALMING

With the coöperation of the State Funeral Directors' Association a School of Embalming has been organized by the University and is conducted for a period of twelve weeks, commencing January 3, 1919. It is under the direction of a committee of the Administrative Board of the Medical School.

Didactic and laboratory instruction is given in anatomy, bacteriology, autopsies, chemistry, public health and sanitation, professional embalming, funeral management, and business principles. Certificates are issued to candidates successfully completing the course and are accepted for state license by the State Board of Health.

Circular of Information will be sent upon application.

TABULAR STATEMENTS OF STUDIES IN THE MEDICAL SCHOOL 1918-1919

SUBJECTS	HOURS		SUBJECTS	HOURS				TOTAL HOURS
	1st Sem.	2nd Sem.		1st Quar.	2nd Quar.	3rd Quar.	4th Quar.	
THIRD YEAR			FOURTH YEAR					
Gross Anatomy..... (3-4)	13	8	Neurology (Anat. 103)	6	6	..	..	96
Histology	10	...	Physiology	8	8	8	8	256
(Anat. 101)	...	6	(103-104)	5	..	..	..	72
Embryology	6	...	Special Bacteriology..... (Path., etc., 105)	..	12	..	..	96
(Anat. 102)	...	10	General Pathology..... (101)	..	..	15	14	232
Physical Chemistry..... (Chem. 121)	...	6	Special Pathology..... (102)	..	..	6	6	80
Physiology Chemistry..... (Physiol. 102)	...	6	Pharmacology	..	..	3	..	24
General Bacteriology..... (Path., etc., 104)	...	...	(102-104)	6	6	6	6	192
			Physical Diagnosis, etc..... (Medicine 50)					
			*Electives					
			* Elective courses are subject to adjustment by the Stu- dents' Work Committee. The hours are distributed in this schedule on a basis of average assignment.					
Sub-totals	29	30	Sub-totals	19	32	38	34	1,048
Third Year, Total Hours.....			Fourth Year, Total Hours.....					

SUBJECTS		HOURS				TOTAL HOURS
1st Quar.	2nd Quar.	3rd Quar.	4th Quar.	TOTAL HOURS		
FIFTH YEAR						
Pharmacology and Therapeutics. (103)	1	1	2	2	48	8
Clinical Pathology.....	4	4	..	..	64	32
Medicine (51 to 57)	8	8	7	7	240	64
Nervous and Mental Diseases.... (75-76)	..	1	2	2	40	8
Dermatology	1	1	1	..	24	16
Diseases of Children..... (Pediatrics 101-102)	1	2	2	2	56	32
Principles of Surgery..... (54)	2	2	2	1	56	16
General Surgery..... (51)	2	2	2	..	32	32
Regional Surgery..... (56)	..	..	3	3	48	16
Surgical Quiz..... (52)	..	..	1	1	16	80
Surgical Diagnostic Clinic..... (59-60)	1	1	1	1	32	592
Obstetrics	2	2	2	2	64	192
Gynecology	2	..	..	..	16	
Section Clinics..... (Obst. 53)	6	6	6	6	192	
Electives	6	6	6	6	192	
Sub-totals	36	36	37	33	1,120	1,088
Fifth Year, Total Hours.....						
SUBJECTS		HOURS <th rowspan="2">TOTAL HOURS</th>				TOTAL HOURS
SIXTH YEAR		1st Quar.	2nd Quar.	3rd Quar.	4th Quar.	
Therapeutic Conference..... (Pharm. 107)		1	1	..	..	8
Hygiene		2	2	..	..	32
(Path., etc., 106-107)						
Medical Clinic..... (Medicine 63-64)		2	2	2	2	64
Mouth Infections..... (Medicine 60)		..	..	1	..	8
Medical Jurisprudence..... (Medicine 62)		..	..	2	..	16
General Surgery..... (55)		..	..	2	2	32
Urology		1	1	..	..	16
(Surgery 73)						
Ophthalmology and Otology..... (79)		2	2	..	..	32
Rhinology and Laryngology..... (81)		1	1	..	..	16
Obstetrics and Gynecology..... (57 to 61)		2	2	3	3	80
Section Clinics and Clerkships..		18	18	19	19	592
Electives		6	6	6	6	192
Sub-totals		34	34	35	32	1,088
Sixth Year, Total Hours.....						

DEPARTMENTAL STATEMENTS*

THE DEPARTMENT OF ANATOMY

Professors CLARENCE M. JACKSON, JOHN B. JOHNSTON, THOMAS G. LEE, RICHARD E. SCAMMON; Associate Professor CHARLES A. ERDMANN; Assistant Professor ANDREW T. RASMUSSEN; Instructor JAY A. MYERS; Assistants ROBERT S. GUTSELL, RUSSELL W. MORSE, BYRON L. ROBINSON, ROY E. ST. CLAIR, FAUS P. SILVERNALE; Teaching Fellows HELEN A. MACKEEN, HJALMAR L. OSTERUD.

Departmental Office, Institute of Anatomy

REQUIRED COURSES

- 1a,b. ELEMENTARY HUMAN ANATOMY. School for Nurses. 48 hours; two credits. ST. CLAIR.
- †3-4. GROSS HUMAN ANATOMY. Dissection, including osteology. A dissected skeleton loaned to every two students. Every student required to dissect lateral half of the body. Third-year medical students and (beginning with the session 1918-19) second-year dental students; 13 hours a week, seven credits, first semester; 8 hours a week, four credits, second semester. 336 hours; eleven credits. JACKSON, ERDMANN, MYERS, and Assistants.
7. HISTOLOGY AND EMBRYOLOGY. Minute structure and development of the tissues and organs. Second-year dental students. 128 hours; four credits. JACKSON, LEE, and Assistants.
101. HUMAN HISTOLOGY. Microscopic study of the various tissues and organs. Third-year medical students. 160 hours; five credits. SCAMMON, and Assistants.
102. HUMAN EMBRYOLOGY. Development of the human body. Third-year medical students. Prerequisite: Course 101. 96 hours; three credits. LEE, SCAMMON, and Assistants.
103. HUMAN NEUROLOGY. A study of the central nervous system and sense organs. Fourth-year medical students. Prerequisite: Courses 101, 102. 96 hours; three credits. JOHNSTON, RASMUSSEN, and Assistants.

* Courses with number followed by "a,b," are given in each semester. Odd numbers denote first semester, and even numbers second semester courses.

† Course 5-6 in Gross Human Anatomy is discontinued after the session 1917-18, dental students being required to take Course 3-4 instead.

ELECTIVE COURSES

- 107-108. MAMMARY GLAND PROBLEMS. A special study of the mammary gland, human and comparative. Laboratory course. 96 hours; three credits, or less. MYERS.
108. ADVANCED OSTEOLOGY. Special study of the skull or other regions. Laboratory. 32 hours, one credit. MYERS.
110. SPECIAL EMBRYOLOGY. Detailed study of the development of man and mammals. Supplementary to Course 102 which must precede or accompany it. 48 hours, one and one-half credits. SCAMMON.
- 111a,b. ANATOMICAL TECHNIQUE. Microtechnique, reconstruction and museum methods, etc. Fourth-, fifth-, or sixth-year medical students. Limited to sixteen students. 96 hours; three credits. LEE.
113. ADVANCED HISTOLOGY. A study of special preparations, including practice in the identification of unknown specimens. Fourth-, fifth-, or sixth-year medical, or graduate students. Limited to sixteen students. Prerequisite: Course 101. 48 hours, one and one-half credits. RASMUSSEN.
114. TOPOGRAPHIC ANATOMY. Based upon a study of serial cross-sections of the human body. Fourth-, fifth-, or sixth-year medical, or graduate students. Prerequisite: Course 3-4. 96 hours, three credits. JACKSON.
115. FETAL ANATOMY. Study of the human fetus, with comparison of earlier embryonic and later post-natal structure. Fourth-, fifth-, or sixth-year medical, or graduate students. Limited to twenty students. Prerequisites: Courses 3-4, 102. 96 hours, three credits. SCAMMON.
117. IMPLANTATION AND PLACENTATION. A study of the implantation of the ovum, and the formation of the placenta, and the earlier stages of embryonic development in man and mammals. Fourth-, fifth-, or sixth-year medical, or graduate students. Limited to twelve students. Prerequisite: Course 102 or equivalent. 96 hours, three credits. LEE.
118. APPLIED ANATOMY. Relationships, with reference to their clinical applications. Fourth-, fifth-, or sixth-year medical, or graduate students. Prerequisite: Course 3-4. 48 hours; one and one-half credits. ERDMANN.
119. SPECIAL DISSECTIONS. Dissections of special regions, including preparation of museum specimens. Fourth-, fifth-, or sixth-year medical, or graduate students. Limited to twenty-four students. Prerequisite: Course 3-4. 96 hours; three credits. ERDMANN.
120. EXPERIMENTAL NEUROLOGY. A study of the morphology of the central nervous system as determined by experimental methods. Fifth-, or sixth-year medical, or graduate students. Limited to five students. Prerequisite: Course 103. 96 hours; three credits. RASMUSSEN.

- 123-124. **ADVANCED ANATOMY.** Advanced work, largely individual in character, in gross anatomy, histology, embryology, or neurology. Open to fourth-, fifth-, or sixth-year medical, or graduate students. Admission only upon approval of instructor. Hours and credits to be arranged. JACKSON, JOHNSTON, LEE, or SCAMMON.
- 201-202. **RESEARCH IN ANATOMY.** Research work in gross or microscopic anatomy, neurology, histology, or embryology, for properly qualified students, graduates, or others, upon approval of any one of the instructors. Hours and credits to be arranged. JACKSON, JOHNSTON, LEE, SCAMMON.
- 203-204. **ANATOMICAL SEMINAR.** Presentation and discussion of research work in progress in the department, together with reviews of current anatomical literature. Open to graduates or others upon approval of instructor. 32 hours; two credits. JACKSON.

THE DEPARTMENT OF PHYSIOLOGY

Professors ELIAS P. LYON, FREDERICK H. SCOTT; Associate Professors RICHARD OLDING BEARD, J. F. MCCLENDON;* Assistant Professors FRANCIS B. KINGSBURY,* CHAUNCEY J. V. PETTIBONE, M. RUSSEL WILCOX; Assistants CARL G. ARVIDSON, CHARLES C. GAULT, JOHN L. MILLS, HERMAN J. MOERSCH; Teaching Fellow ANNA B. YATES.

Departmental Office, Millard Hall

REQUIRED COURSES

- †1-2. **ELEMENTARY PHYSIOLOGY AND HYGIENE.** A course planned to afford teachers a helpful knowledge of the human subject. The study of muscle-nerve function; the circulation; respiration; nervous system and senses. Lectures and laboratory work. 48 hours; two credits, each semester. LYON, BEARD, and Assistant.
- †1X-2X. **ELEMENTARY PHYSIOLOGIC CHEMISTRY.** The chemical components of the body and body fluids; physiology of secretion; digestion, absorption, foods; metabolism and excretion. Lectures and laboratory work. 48 hours, two credits in each semester.
- 3a,b. **ELEMENTARY HUMAN PHYSIOLOGY.** School for Nurses, Home Economics students, and others. Prerequisites: elementary biology and chemistry. 96 hours; three credits. LYON, BEARD, and Assistants.

* On military service.

† Courses 1-2 and 1X-2X are offered in alternate years. Together they are designed to cover the field of physiology in its physical and chemical aspects. These courses are given on Saturdays from 9:00 to 12:00 and are primarily for teachers. Course 1-2 will be given in 1917-18. Course 1X-2X in 1918-19.

4. ELEMENTARY PHYSIOLOGY. Sophomore dental students. Prerequisites: elementary biology or anatomy and chemistry. 80 hours; three credits. LYON, BEARD, SCOTT, and Assistants.
6. ELEMENTARY PHYSIOLOGIC CHEMISTRY. Sophomore dental students. Prerequisite: organic chemistry. 64 hours; two credits. KINGSBURY, PETTIBONE, and Assistants.
102. PHYSIOLOGIC CHEMISTRY. The components of the animal body; foods, digestion, the excreta and metabolism. Third-year medical students and others. Prerequisite: organic chemistry. 160 hours; five credits. KINGSBURY, PETTIBONE, and Assistants.
103. PHYSIOLOGY OF MUSCLE, NERVE, BLOOD, CIRCULATION, AND DIGESTION. Fourth-year medical students and others. Prerequisites: organic chemistry and animal biology. 128 hours; four credits. LYON, SCOTT, BEARD, McCLENDON, and Assistants.
104. PHYSIOLOGY OF THE NERVOUS SYSTEM AND SPECIAL SENSES; RESPIRATION, METABOLISM, NUTRITION, AND EXCRETION. Fourth-year medical students and others. Prerequisites: organic chemistry and animal biology. 128 hours; four credits. LYON, SCOTT, BEARD, McCLENDON, WILCOX, and Assistants.

ELECTIVE COURSES

111. PHYSICAL CHEMISTRY OF CELLS. Osmotic pressure, surface tension and electric conductivity of blood and urine; colloids; permeability of cells and tissues, and changes in permeability produced by electrolytes. Prerequisites: animal biology and two courses in chemistry. 96 hours; three credits. McCLENDON.
112. ELECTRO-PHYSIOLOGY. The bio-electric currents and the theory of stimulation and narcosis. Hydrogen ion concentration and its relation to enzyme activity and irritability. Prerequisites: animal biology and two courses in chemistry. 96 hours; three credits. McCLENDON.
- 113-114. PROBLEMS IN PHYSIOLOGY. Arranged by instructors with qualified students. Each student will be assigned a topic for special laboratory study, leading in some cases to original investigation. Fourth-, fifth-, or sixth-year medical students and others. 96 hours; three credits, or more; either or both semesters. LYON, SCOTT, McCLENDON.
- 115-116. CONFERENCE COURSE IN PRINCIPLES OF PHYSIOLOGY; STUDENT SEMINAR. Informal lectures and library study. Basis of study, Bayliss' *Text-Book*. Fourth-, fifth-, and sixth-year medical students and others. 12 hours, each quarter; one and one-half credits, each semester. LYON, SCOTT, McCLENDON.
131. ADVANCED PHYSIOLOGY OF MUSCLE AND BLOOD. Alterations due to physiological conditions. Methods of examination. Fourth-, fifth-,

- or sixth-year medical students. Limited to sixteen students. 48 hours; one and one-half credits. SCOTT.
132. ADVANCED PHYSIOLOGY OF THE CIRCULATION AND DIGESTION. Conference and laboratory work. Open to fourth-, fifth-, or sixth-year medical students. Limited to sixteen students. Conference may be taken separately. 24 or 48 hours; three-fourths or one and one-half credits. SCOTT.
137. FOODS AND PRACTICAL DIETETICS. A study of human foods and food values; of the principles of food selection; of caloric indices and balanced dietaries. Exercises in the practical preparation of foods. Open to fourth-, fifth-, or sixth-year medical students. Limited to twelve students. 48 hours; two credits. BEARD, assisted by Miss THOMAS.
138. PHYSIOLOGY OF DEVELOPMENT. The physiology of the ovum, the embryo, the fetus; the functions of menstruation, ovulation, pregnancy, parturition and lactation; the functional characteristics of birth, infancy, childhood, adolescence, maturity, and old age. Open to fourth-, fifth-, or sixth-year medical students. 32 hours; two credits. BEARD.
139. EXAMINATION OF THE EYE AND EAR. A study of advanced methods. Lectures, demonstrations, and laboratory exercises. Prerequisite: Course 104. Open to fifth- or sixth-year medical students. 24 hours; one credit. WILCOX.
140. PHYSIOLOGY OF ACCOMMODATION. A study of optical principles and methods. Lectures, demonstrations, and laboratory exercises. Open to fifth- or sixth-year medical students. 24 hours; one credit. WILCOX.
- 151-152. PHYSIOLOGIC CHEMISTRY. The components of the body, foods, digestion, and metabolism. Prerequisite: organic chemistry. Open to qualified students in all divisions of the University. May be taken by medical students in place of Course 102. 192 hours; six credits. KINGSBURY.
- 153-154. ADVANCED PHYSIOLOGIC CHEMISTRY. Course arranged by instructors with qualified students for special work. Open to fourth-, fifth-, or sixth-year medical students and others; may be taken in either semester or both. Prerequisite: Course 102. 96 hours; three credits, either semester or both. PETTIBONE, KINGSBURY.
161. URINALYSIS. Advanced methods. Open to fourth-, fifth-, or sixth-year medical and other qualified students. First quarter. Prerequisite: Course 102. 48 hours; one and one-half credits. PETTIBONE.
163. METABOLISM. Lectures and laboratory work on special phases of metabolism. Lectures may be taken alone; number of students unlimited; laboratory course limited to ten students. Open to fourth-,

fifth-, or sixth-year medical students and others. Prerequisite: Course 102. 48 hours; three-fourths or one and one-half credits. PETTIBONE.

†164. QUANTITATIVE METHODS. The estimation of certain important substances in the urine, blood, and other body fluids. Open to fourth-, fifth-, or sixth-year medical students and others. Prerequisite: Course 102. 96 hours; three credits. KINGSBURY.

201-202. SEMINAR IN PHYSIOLOGY AND PHARMACOLOGY. For instructors and advanced students. 16 hours, each semester; one credit. LYON, HIRSCHFELDER, and Staff.

203-204. RESEARCH IN PHYSIOLOGY. Hours and credits arranged. LYON, SCOTT, McCLENDON.

205-206. RESEARCH IN PHYSIOLOGIC CHEMISTRY. Hours and credits arranged. KINGSBURY, PETTIBONE.

†208. SEMINAR IN PHYSIOLOGIC OPTICS. Primarily for graduate students. Open to sixth-year medical students. 24 hours; one and one-half credits. LYON.

†210. PHYSIOLOGIC OPTICS. A laboratory course. For graduate and sixth-year students. 48 hours. One and one-half credits. LYON.

DEPARTMENT OF PHARMACOLOGY

Professor ARTHUR D. HIRSCHFELDER; Associate Professor EDGAR D. BROWN; Assistant ALFRED E. LANGE.

Departmental Office, Millard Hall

REQUIRED COURSES

1a,b. ELEMENTARY PHARMACOLOGY. A study of the history, uses, classification, and preparation of drugs; definition of descriptive terms; systems of weights and measures; methods of administration, principles of dosage, etc. School for Nurses and others. 64 hours; three credits.

4. COURSE IN PHARMACOLOGY. The history, origin, nature, pharmacological preparations, and uses of drugs, including the discussion of their physiologic, pharmacologic, and therapeutic actions. Second-year dental students. 48 hours; three credits.

102. GENERAL PHARMACOLOGY. The principles underlying the structure, physicochemical properties, physiologic, therapeutic, and toxic actions of substances, natural or synthetic, used as medicines. Fourth-year medical students. 32 hours; two credits. HIRSCHFELDER, BROWN.

† Probably not offered in 1918-19.

104. EXPERIMENTAL PHARMACOLOGY. Exercises illustrating the preparation and action of medicines, their relation to chemical structure, and their mode of administration. Fourth-year medical students. 48 hours; one and one-half credits. HIRSCHFELDER, BROWN.
- 105a,b. GENERAL PHARMACOLOGY AND THERAPEUTICS. A more detailed study of drugs important in clinical practice, covering the relations of chemical structure to physiologic and therapeutic action and modes of application in clinical medicine. Fifth-year medical students. 48 hours; two credits. HIRSCHFELDER, BROWN.
- 107a,b. THERAPEUTIC CONFERENCE. Discussion of the treatment of diseases based upon a study of notes of typical cases. One half the class each semester; sixth-year students; 8 hours. HIRSCHFELDER, BROWN.

ELECTIVE COURSES

6. EXPERIMENTAL PHARMACOLOGY. Experiments upon the effects of the important heart and nerve stimulants, sedatives, purgatives, and antiseptics. Offered to dental and pharmacy students and nurses. 24 to 48 hours; one to two credits. HIRSCHFELDER, BROWN.
- 109a,b. EXPERIMENTAL PHARMACOLOGY. Special investigation and experimental study of one or more subjects in pharmacology, in which the student is given an opportunity of choice of the following topics:
- a. Anesthetics, general and local; the principles and dangers of anesthesia.
 - b. Stimulants and depressants of the circulation and their relation to the treatment of heart disease.
 - c. Drugs acting upon the kidneys, normal or diseased.
 - d. Urinary antiseptics and the urinary excretion of drugs.
 - e. Action and detection of poisons and their antidotes.
 - f. Detailed study of the effects in man of the common harmless drugs.
 - g. The internal secretions and gland extracts; their effect upon the action of drugs.
 - h. Action of drugs upon animal and bacterial parasites, tumors, etc.
- Offered in the second half of the fourth year and in the entire fifth or sixth year. 24 or 48 hours; one or two credits, each semester. HIRSCHFELDER, BROWN.
110. POISONS. Their detection, action, and antidotes. Open to fourth-, fifth-, or sixth-year medical students. 48 hours; one and one-half credits. BROWN.
- 111a,b. PRESCRIPTION WRITING. The principles of prescription writing; study of the flavoring, coloring, and incompatibilities of drugs. Open to fourth-, fifth-, or sixth-year medical students. 16 hours; one credit. BROWN.

112. PRACTICAL MATERIA MEDICA AND PRESCRIPTION WRITING. The study of crude drugs, pharmaceutical preparations, and of the flavoring and compounding of prescriptions. Open to fourth-, fifth-, and sixth-year medical students. 8 hours; one-half credit. BROWN.
- 201-202. SEMINAR IN PHYSIOLOGY AND PHARMACOLOGY. Reviews of recent literature bearing upon physiologic and pharmacologic subjects. Conducted by department directors, with the collaboration of the staffs and of qualified graduate or undergraduate students. 32 hours.
- 203-204. RESEARCH IN PHARMACOLOGY. HIRSCHFELDER, BROWN.

THE DEPARTMENT OF PATHOLOGY, BACTERIOLOGY, AND PUBLIC HEALTH

Professor HAROLD E. ROBERTSON;* Associate Professors ELEXIOUS T. BELL, WINFORD P. LARSON; Assistant Professors MOSES BARRON,* ARTHUR HENRICI,* Instructors ANNE BENTON, JOHN C. MCKINLEY, CHESTER A. STEWART, MARGARET WARWICK; Assistants SIEGFRIED F. HERRMANN, HUGH T. JONES, ORVILLE N. NELSON.

Departmental Office, Institute of Public Health and Pathology

REQUIRED COURSES

3. BACTERIOLOGY. The principles governing the isolation and study of bacteria. The bacteria and other parasites of the mouth and teeth. Studies of pathogenic organisms which produce, or appear in rheumatism; relation to infections of the teeth. Dental students. 96 hours; four credits. LARSON, BENTON, and Assistants.
4. PATHOLOGY. The study and recognition of gross and microscopic disease processes. The principles of general pathology with special consideration of diseases peculiar to the mouth and teeth and important in dental practice. Dental students. 96 hours; four credits. STEWART, WARWICK, and Assistants.
- 6a,b. ELEMENTARY BACTERIOLOGY. The principles and technique of general bacteriology. Studies in the morphologic and biologic characters of the common bacteria. Preparation of culture media. Disinfectants and disinfection. Bacteriology of water and food products. Students of Home Economics, Agriculture, Nursing, etc. 80 hours; three credits. LARSON, BENTON, MCKINLEY, and Assistants.
101. GENERAL PATHOLOGY. The general principles governing pathologic changes, including disturbances of the circulation and metabolism; inflammation, regeneration, and repair; tumor formation. The study and recognition of gross and microscopic lesions. Fourth-year medi-

* On military service.

- cal students. Prerequisites: histology and special bacteriology. 96 hours; four credits. BELL, MCKINLEY, STEWART.
102. SPECIAL PATHOLOGY. The study of the pathologic processes of infectious diseases, such as diphtheria, typhoid fever, etc.; the special pathology of lesions in various organs, systems of organs, and tissues of the body. Fourth-year medical students. Prerequisite: general pathology. 232 hours; eight credits. BELL, MCKINLEY, STEWART.
103. CLINICAL PATHOLOGY. The principles and methods involved in the examination of urine, blood, stomach contents, feces, sputum, exudates, and transudates; the relation of pathologic findings to the diagnosis of disease. Fifth-year medical students. 64 hours. WARWICK.
104. GENERAL BACTERIOLOGY. The preparation of culture media; the morphology of bacteria; methods of staining and identification; anaerobic bacteria; principles of sterilization and disinfection; examination of air, water, milk; relation of bacteriology to the industries. Third-year medical students and others. Prerequisites: general chemistry, and botany or zoology. 96 hours; four credits. LARSON, BENTON, and Assistants.
105. SPECIAL BACTERIOLOGY. The study of pathogenic bacteria, especially in relation to definite diseases; bacteriological methods in clinical diagnosis; principles of infection and immunity, with practical application of serum reactions. Fourth-year medical students and others. Prerequisite: general bacteriology. 72 hours; three credits. LARSON, BENTON, and Assistants.
107. PREVENTIVE MEDICINE AND HYGIENE. A systematic study of the principles of personal and communal hygiene and of general procedures for the protection of the public health. Sixth-year medical students. 32 hours. BEARD.
- 109a,b. CLINICAL PATHOLOGY. Practical work in the examination of blood, urine, stomach contents, sputum, etc. Conducted in the Out-patient Department with class sections. Sixth-year medical students. 12 hours. WARWICK.
- 111a,b. AUTOPSIES. Technique of performing autopsies; making autopsy records; examination of fresh organs removed from these autopsies. Opportunities afforded to study observed lesions microscopically. Three or four students called to each post-mortem, excused from regular classes. Preference given to senior students. Each candidate for the degree must have taken part in at least four autopsies. Fifth- and sixth-year medical students. The Staff.

ELECTIVE COURSES

- †112. PATHOLOGIC TECHNIQUE. General and special methods of preparation of microscopic and gross pathologic specimens; including prac-

† Probably not offered in 1918-19.

tice with freezing microtome, celloidin and paraffin embedding methods, general and special stains, preparation of museum specimens, etc. Limited to ten students. Fourth-, fifth-, and sixth-year medical students. Prerequisite: general pathology. 48 hours; one and one-half credits.

113a,b. **ADVANCED PATHOLOGY.** Laboratory studies in the examination of routine operative and autopsy specimens, with the investigation of special associated problems. Credit for work in this course is to be judged entirely by the character and amount of work accomplished. Dates and hours to be arranged. The Staff.

114. **ADVANCED BACTERIOLOGY.** An advanced course giving additional work in bacteriology and the opportunity of working out special problems. Fifth-year medical students. Limited to ten students. 48 hours; one and one-half credits. LARSON.

115a,b. **COURSE IN IMMUNITY.** Laws of hemolysis. Quantitative relationship between antigen and antibody. Wassermann reaction. Opsonins. Vaccines. Precipitin reaction. Abderhalden reaction. Anaphylaxis. Fifth- and sixth-year medical students. Limited to ten students in each semester. 48 hours; one and one-half credits. LARSON.

117. **DIAGNOSIS OF TUMORS.** Rapid diagnosis and study of tumors and other pathologic conditions simulating tumor formation. Fifth- and sixth-year medical students. Prerequisite: special pathology. 48 hours; one and one-half credits. BELL.

118. **GYNECOLOGICAL PATHOLOGY.** The special study of pathologic conditions found in the female genital tract. This elective is an integral part of Course 102, special pathology. Fourth-, fifth-, or sixth-year medical students. 48 hours; one and one-half credits. BELL, ADAIR.

†120. **NEUROPATHOLOGY.** The special study of pathologic conditions of the nerve tissues in lesions of the central and peripheral nervous system. This elective is an integral part of Course 102, special pathology. Fourth-, fifth-, or sixth-year medical students. 24 hours; three-fourths credit. BELL, HAMILTON.

121. **CLINICAL LABORATORY COURSE.** Practical diagnostic study in the Out-patient Department laboratory. Limited to sections of four students. Fifth- or sixth-year medical students. 36 hours; one credit. WARWICK.

122. **MEDICAL ENTOMOLOGY.** A study of insects, and their allies, which are disease-bearers or parasites of man; life-history, habits, and methods of control. Fourth-, fifth-, or sixth-year students. Prerequisite: animal biology. 32 hours; two credits. HOWARD.

† Probably not offered in 1918-19.

- †124. HEMATOLOGY. Advanced studies in diseases of the blood; with particular attention to special technical procedures and the significance of laboratory findings. Fifth- or sixth-year medical students. 48 hours; one and one-half credits.
- 201-202. RESEARCH. Graduate students, of the necessary preliminary training, may elect research, either as majors or minors in pathology. Hours and credits to be arranged. BELL.
- 203-204. RESEARCH. Graduate students of the necessary preliminary training may elect research, either as majors or minors, in bacteriology. Hours and credits to be arranged. LARSON.
125. PUBLIC SCHOOL MEDICAL WORK. Lectures on the duties and qualifications of school medical officers. Fifth and sixth years. 8 hours. CHARLES H. KEENE, M.D., Director of Hygiene, Minneapolis Schools.
- 127a,b. PRACTICAL MEDICAL WORK, in the schools of Minneapolis, by school physicians. Fifth and sixth years, 24 hours. DR. KEENE and others.

DEPARTMENT OF SURGERY

Professors JAMES E. MOORE, ARTHUR J. GILLETTE; Associate Professors J. FRANK CORBETT,* ARTHUR A. LAW,* ARCHIBALD MACLAREN, ARTHUR T. MANN, JOHN T. ROGERS; Assistant Professors ALEXANDER R. COLVIN, EMIL S. GEIST,* OSCAR OWRE, CHARLES A. REED,* HARRY P. RITCHIE, ARTHUR C. STRACHAUER, FRANKLIN R. WRIGHT; Instructors JOHN S. ABBOTT,* PAUL F. BROWN,* CARL C. CHATTERTON, WALLACE COLE,* PAUL W. GIESSLER,* HUGO J. HARTIG, JOHN P. HIEBERT, JAMES A. JOHNSON, WALTER J. KREMER, FREDERICK H. POPPE, JOHN C. STALEY, HENRY C. STUHR, ANTON G. WETHALL, HARRY B. ZIMMERMAN;* Assistants LOUIS E. DAUGHERTY, WALTER A. FANSLER, CHARLES A. HALLBERG,* ARNOLD L. HAMEL, M. KELLER KNAUFF, FREDERICK A. OLSON, MANFORD O. OPPEGAARD,* EMIL C. ROBITSHEK, GILBERT J. THOMAS;* Teaching Fellow EARL CRAFTS.

Departmental Office, Millard Hall

REQUIRED COURSES

51. GENERAL SURGERY. The diseases and injuries of tendons, fasciae, bursae, blood-vessels, nerves, brain, and meninges. Lectures and demonstrations. Fifth year. 32 hours. LAW.
- 53-54. PRINCIPLES OF SURGERY. A study of surgical inflammations, etc.; illustrated by gross and microscopic preparations from the living

* On military service.

† Probably not offered in 1918-19.

subject and from experimental courses. Lectures and demonstrations. Fifth year. 56 hours. CORBETT.

56. REGIONAL SURGERY. The practical surgery of the several regions of the body; diseases of bones, injuries, and acute diseases of joints, etc. Lectures and demonstrations. Fifth year. 48 hours. MOORE.
58. GENERAL SURGERY. Fractures and dislocations. Lectures and demonstrations. Sixth year. 32 hours. LAW.
- 59-60. DIAGNOSTIC CLINIC. A series of clinics upon the diagnosis of surgical conditions as presented in the hospital wards. Fifth year. 32 hours. MOORE.
- 61-62. DIAGNOSTIC AND OPERATIVE CLINIC. A course in operative procedure conducted at the University Hospitals, the Minneapolis City Hospital, and the City and County Hospital at St. Paul, on Thursdays and Saturdays, throughout the year. Fifth-year class, in sections. 56 hours. MOORE, LAW, MACLAREN, RITCHIE, STRACHAUER, CORBETT, MANN, ROGERS, COLVIN, JOHNSON, HARTIG, HIEBERT, POPPE, STUHR.
- 63a,b. DIAGNOSTIC CLINIC. A series of clinics in which the students are assigned cases for presentation before the class; taking case histories, making diagnosis, and suggesting treatment, under supervision. Sixth year. 64 hours. MOORE.
- 64a,b. OPERATIVE CLINIC. A course of operations in the University Hospitals, the Minneapolis City Hospital, and the City and County Hospital at St. Paul, on Tuesdays, Thursdays, and Saturdays. For sections of class; sixth year. 48 hours. MOORE, LAW, MACLAREN, RITCHIE, STRACHAUER, CORBETT, MANN, ROGERS, COLVIN, JOHNSON, HARTIG, HIEBERT, POPPE, STUHR.
- 65a,b. MINOR OPERATIVE CLINICS. Course conducted with class sections on three days in each week at the Outpatient Department. Sixth year. 12 hours. JOHNSON and Assistants.
66. MEDICAL ETHICS AND ECONOMICS. Sixth year. 8 hours. MOORE.

ELECTIVE COURSES

- 101a,b. COURSE IN MINOR SURGERY. The study of diagnosis and treatment of selected cases. Sixth year. 36 hours. JOHNSON and Assistants.
103. OPERATIVE COURSE ON THE CADAVER. The technique of abdominal incision and closure; of bowel suturing, appendiceal removal, kidney exploration, nephrotomy, tracheotomy, amputations, ligations, and other problems in emergency surgery. Fifth year. 32 hours. CORBETT.

104. COURSE IN EXPERIMENTAL SURGERY. A study of surgical technique by cardinal operations upon animals. Sixth year. 40 hours. CORBETT.
- 105a,b. DIAGNOSTIC CLINIC, WITH OCCASIONAL OPERATIONS. Conducted at the City and County Hospital, St. Paul. Limited to ten students. Fifth or sixth year. 12 hours. COLVIN.
- 107a,b. EXTRACTION OF TEETH. Course offered in the College of Dentistry. Limited to eight students. Fifth or sixth year. 8 hours. GRIFFITH.

DIVISION OF ORTHOPEDIA

REQUIRED COURSES

- 70a,b. ORTHOPEDIC SURGERY. A course of clinical lectures and operations conducted in each quarter, with divisions of class, at the Hospital for Crippled and Deformed at Phalen Park. Sixth year. 24 hours. GILLETTE, CHATTERTON.
- 71a,b. ORTHOPEDIC CLINIC. A study of cases of orthopedic disease and treatment at the Outpatient Department; with class sections, three weekly sessions. Sixth year. 8 hours. GEIST, COLE, REED.

ELECTIVE COURSES

- 113a,b. CLINIC IN ORTHOPEDIC SURGERY. The study of selected cases. Conducted in Outpatient Department. Limited to three students. Sixth year. 36 hours. GEIST, REED.
114. ORTHOPEDIC SURGERY. Illustrated clinical lectures. Sixth year. 24 hours. GEIST.
- 115a,b. CLINIC IN ORTHOPEDIC SURGERY. Conducted at Phalen Park Hospital for the Crippled and Deformed. 24 hours in each semester. CHATTERTON.

DIVISION OF UROLOGY

REQUIRED COURSES

73. GENITO-URINARY DISEASES. The etiology, diagnosis, and treatment of this group of diseases. A course of lectures. Sixth year. 16 hours. WRIGHT.
- 75a,b. GENITO-URINARY CLINIC. The study of cases at the bedside and in the operating rooms of the several hospitals. Sixth year. 8 hours. OWRE, WRIGHT.
- 77a,b. GENITO-URINARY CLINIC. The observation, examination, and treatment of patients in the Outpatient Service at three weekly sessions. Sixth year. 8 hours. OWRE, WRIGHT, and Assistants.

ELECTIVE COURSES

- 117a,b. GENITO-URINARY DISEASES. The study of cases in the Outpatient Clinics, giving the student the opportunity of examination and supervised treatment of patients. Sixth year. 36 hours. OWRE, WRIGHT, and Assistants.
- 118a,b. ENDOSCOPY AND CYSTOSCOPY. Methods of investigation and treatment. Conducted in Outpatient Department. Sixth year. 8 hours. WRIGHT.

DEPARTMENT OF MEDICINE

Professors LEONARD G. ROWNTREE, ARTHUR S. HAMILTON, S. MARX WHITE,* ARTHUR A. SWEENEY; Research Professor THOMAS B. HARTZELL; Associate Professor JAMES S. GILFILLAN; Assistant Professors FRANCIS G. BLAKE,* JOHN BUTLER,* CHARLES D. FREEMAN, ALEXANDER R. HALL,* ERNEST M. HAMMES, HARRY G. IRVINE, ANGUS W. MORRISON,* GEORGE M. OLSON, ERNEST T. F. RICHARDS, JOHN P. SCHNEIDER, SAMUEL E. SWEITZER, HENRY L. ULRICH; Lecturer HENRY WIREMAN COOK; Instructors JOHN M. ARMSTRONG, J. FOWLER AVERY,* ARCHIBALD H. BEARD,* PAUL B. COOK,* CHARLES R. DRAKE, EDWIN L. GARDNER, OLGA S. HANSEN, RALPH E. MORRIS,* ROBERT I. RIZER, FREDERICK W. WITTICH, CHARLES B. WRIGHT; Research Assistant WILLIAM A. GREY; Assistants LOUISA M. BOUTELLE, EDWARD J. ENGBERG,* WALTER A. FANSLER, ERNEST S. MARIETTE, JOSEPH C. MICHAELS,* FREDERICK P. MOERSCH,* HARRY P. NORDLEY,* JOHN H. SCHROEDER; Teaching Fellows FLOYD GRAVE, CHARLES E. NIXON.

Departmental Office, Millard Hall

REQUIRED COURSES

50. PHYSICAL DIAGNOSIS. A study of general symptomatology, and of methods of physical examination, diagnosis, and record, with demonstrations upon the normal and abnormal subject; introductory to the group teaching of physical diagnosis in the fifth year. Fourth year. 24 hours. ROWNTREE, SCHNEIDER, and Assistants.
- 51-52. THE PRINCIPLES AND PRACTICE OF MEDICINE. Diseases of the heart and blood-vessels; of the bronchi, lungs, and pleura; of the intestinal tract; renal diseases; acute infections. Fifth year. 64 hours. ROWNTREE, RICHARDS, GARDNER, RIZER, WITTICH.
- 53a,b. PHYSICAL DIAGNOSIS AND CASE TAKING. Studies conducted, with divisions of the class, in the following clinics: (1) cardiac and vascular diseases; (2) respiratory diseases and tuberculosis; (3) metabolic diseases; (4) gastro-intestinal diseases; (5) nervous diseases; (6) dermatology and syphilis. See also Courses 77 and 85. Fifth

- year. 144 hours. IRVINE, OLSON, SCHNEIDER, SWEITZER, RIZER, WITTICH, WRIGHT, and Assistants.
55. PHYSICAL DIAGNOSIS. A course of lectures in elaboration of the practical work in the Outpatient Service. Fifth year. 16 hours. SCHNEIDER, RIZER, WITTICH.
56. PRACTICAL THERAPY AND THERAPEUTIC TECHNIQUE. A study of special methods of therapeusis. Fifth year. 16 hours. RICHARDS.
- 57a,b. CLINIC IN MEDICINE. Conducted in the University Hospital. Fifth year; one half the class in each semester. 16 hours. ULRICH.
- 59a,b. SECTION CLINICS IN MEDICINE. Conducted throughout the year in the Minneapolis City Hospital and the City and County Hospital, St. Paul. Fifth year. 48 hours. GILFILLAN, HALL, GARDNER.
60. MOUTH INFECTIONS. The typical infections of the oral cavity and their causal relations to disease. Fourth quarter. Sixth year. 8 hours. HARTZELL.
62. MEDICAL JURISPRUDENCE. The principles of law, the rules of evidence, and the duties of physicians in medico-legal cases. Third quarter. Sixth year. 16 hours. SWEENEY.
- 63a,b. CLINIC IN MEDICINE. A study of cases and case histories in the University Hospital service. Sixth year. 64 hours. ROWNTREE.
- 65a,b. CLINICAL CLERKSHIPS. The personal and direct observation of patients in hospital under the supervision of the staff; the taking and recording of case histories and the making of provisional diagnoses. One fourth of class in each quarter. Hospital open for this service from 9:30 to 12 and 1 to 4:30. Sixth year. 144 hours.
- 67a,b. SECTION CLINICS IN MEDICINE. Conducted throughout the year at the Minneapolis City Hospital and the City and County Hospital of St. Paul. Sixth year. 8 hours. GILFILLAN, GARDNER, HALL.
- 107a,b. CLINICAL-THERAPEUTIC CONFERENCE. A weekly conference in which the clinical features and the treatment of cases are discussed; followed by a reproduction of corresponding lesions and therapeutic effects in the animal. Sixth year. 32 hours. ROWNTREE, HIRSCHFELDER.

ELECTIVE COURSES

- 101a,b. CLINICAL ELECTIVES, offering the student an assistantship in the Outpatient Department in any of the services in medicine, nervous and mental diseases, and dermatology and syphilis. For services, see Courses 53, 119, 121. Sixth year. Open to two students, who have completed clinical clerkships, in each service and in each quarter. 36 hours. The Staff.

- 103a,b. **BEDSIDE CLINICS IN MEDICINE.** Conducted at the City and County Hospital, St. Paul. Limited to ten students. Fifth year. 12 hours. HALL.
104. **THE EXAMINATION FOR LIFE INSURANCE.** The requirements of standard and special examinations of applicants for life insurance. Fifth or sixth year. 8 hours. COOK.
105. **ACUTE INFECTIOUS DISEASES.** Non-contagious. A comparative study of fevers. City Hospital. Limited to six students. Sixth year. 8 hours.
106. **DISEASES OF THE RESPIRATORY TRACT.** A study of physical signs. City Hospital. Limited to six students. Fifth year. 8 hours.
108. **ADVANCED WORK IN GRAPHIC RECORDING AND FUNCTIONAL DIAGNOSIS OF CARDIO-VASCULAR DISEASES.** A study of the use of the polygraph and electro-cardiograph. Limited to six students. Sixth year. 16 hours. WHITE.
- 103a,b. **ADVANCED PHYSICAL DIAGNOSIS OF THE CHEST.** Practical work on tuberculous patients at available hospitals. Two classes of six students each. Fifth and sixth year. WITTICH and Associates.
110. **STUDIES IN METABOLISM, CLINICAL AND EXPERIMENTAL.** Limited to six students. Sixth year. 48 hours. ROWNTREE and Staff.
111. **PROBLEMS IN ADVANCED MEDICAL DIAGNOSIS.** Limited to four students. Sixth year. 16 hours. ULRICH.

DIVISION OF NERVOUS AND MENTAL DISEASES

REQUIRED COURSES

69. **NEUROLOGY AND NEUROLOGIC DIAGNOSIS.** The general symptomatology and methods of examination of the nervous system; the etiology, pathology, diagnosis and treatment of the special diseases of the nervous system. Lectures, recitations, and lantern demonstrations. Fifth year. 24 hours. HAMILTON, HAMMES.
70. **PSYCHIATRY.** The principal data and methods of modern psychiatry, with the diagnosis and treatment of the various mental disorders. Lectures, recitations, and demonstrations. Prerequisite: Course 75. Fifth year. 16 hours. HAMILTON.
- 71a,b. **CLINICAL NEUROLOGY AND PSYCHIATRY.** Section clinics in nervous and mental diseases, conducted at the University Hospital, the Minneapolis City Hospital, and the City and County Hospital, St. Paul. Fifth year. 20 hours. HAMILTON, HAMMES, NIXON.
- 73a,b. **ADVANCED SECTION CLINICS** conducted at the above hospitals throughout the year. Sixth year. 20 hours. HAMILTON, HAMMES.

75a,b. PERSONAL OBSERVATION AND STUDY of cases of nervous and mental disease in the University Outpatient Service. In sections. Sixth year. 12 hours.

77a,b. PHYSICAL DIAGNOSIS AND CASE TAKING. Studies conducted with divisions of the class in medical clinics, including neurology, in the Outpatient Department. See Course 53a,b. Fifth year. 24 hours.

ELECTIVE COURSES

113. PATHOLOGY OF THE NERVOUS SYSTEM. The exhibition of gross and microscopic preparations of diseased nerve tissues; the relations existing between pathologic lesions and signs and symptoms; the chief neurone systems and the principles underlying their degeneration. Limited to four students. Prerequisites: Courses 75 and 76. Sixth year. 8 hours. HAMILTON, NIXON.

115. ORGANIC NERVOUS DISEASES. Advanced diagnosis of nervous diseases, with a view of giving each student practical experience in all the chief diagnostic procedures employed in the study of nervous diseases. Limited to four students. Prerequisites: Courses 75 and 76. Sixth year. 16 hours. HAMILTON.

116. SYPHILITIC NERVOUS AFFECTIONS. The diagnosis and treatment of the expressions of syphilis in the central nervous system, combining clinical and laboratory teaching and referring particularly to dementia paralytica and tabes dorsalis. Limited to six students. Sixth year. 16 hours. HAMMES.

118. REGIONAL DISEASES. A didactic and clinical conference on the regional diagnosis of lesions of the nervous system. Limited to four students. Third quarter, sixth year. 8 hours.

119a,b. CLINICAL ASSISTANTSHIP, in nervous and mental diseases in the Outpatient Department. Sixth year. Open to two students in each quarter. 36 hours.

DIVISION OF DERMATOLOGY

REQUIRED COURSES

79. COURSE IN DERMATOLOGY. Clinical lectures upon the common skin diseases and syphilis, including diagnosis and treatment. Fifth year. 32 hours. SWEITZER.

81a,b. CLINICAL DERMATOLOGY. Section clinics conducted at the City and County Hospital, St. Paul. Sixth year. 4 hours.

83a,b. CLINIC IN DERMATOLOGY. The practical study of cases of skin and syphilitic disease, in the Outpatient Service. Sixth year. 12 hours. IRVINE, OLSON, SWEITZER.

- 85a,b. PHYSICAL DIAGNOSIS AND CASE TAKING. Studies conducted with divisions of the class in medical clinics, including dermatology and syphilis, in the Outpatient Department. See Course 53a,b. Fifth year. 24 hours. IRVINE, OLSON, SWEITZER.

ELECTIVE COURSES

- 121a,b. ASSISTANTSHIP IN DERMATOLOGY, in the Outpatient Department. Sixth year. Open to two students in each quarter. 36 hours. SWEITZER, IRVINE, OLSON.
- 123a,b. WARD CLINICS IN DERMATOLOGY. Conducted in the City and County Hospital, St. Paul. Limited to ten students. Fifth or sixth year. 12 hours.

THE DEPARTMENT OF OBSTETRICS AND GYNECOLOGY

Professor JENNINGS C. LITZENBERG; Associate Professors FRED L. ADAIR, JOHN L. ROTHROCK; Instructors J. WARREN BELL,* WILLIAM H. CONDIT, RAE T. LAVAKE,* CLARENCE O. MALAND, WILLMAR C. RUTHERFORD,* JALMAR SIMONS; Assistants ELIZABETH BARNARD, JAMES F. HAMMOND,* MENDELSSOHN JONES, FREDERICK J. SOUBA; Teaching Fellows LEE W. BARRY, LEROY A. CALKINS, GORDON M. CLARK.

Departmental Office, Institute of Anatomy

REQUIRED COURSES

- 51-52. OBSTETRICS. The physiology and pathology of pregnancy, parturition and the puerperium. Lectures and recitations. Fifth year. 64 hours. ADAIR, CONDIT.
53. GYNECOLOGY. Course in gynecologic diagnosis. Fifth year. 16 hours. LITZENBERG.
- 55a,b. CLINICS IN OBSTETRICS AND GYNECOLOGY. Sections of the class at the Minneapolis City Hospital, City and County Hospital, St. Paul. Fifth year. 10 hours. ROTHROCK, RUTHERFORD, ADAIR, and Assistants.
57. OBSTETRICS. A study of the pathology of pregnancy and parturition and of the puerperium. Sixth year. 32 hours. LITZENBERG.
59. GYNECOLOGY. A study of the diseases of women. Sixth year. 32 hours. LITZENBERG.
- *61. CASE ANALYSIS IN OBSTETRICS AND GYNECOLOGY. A course in the analytical study of cases. Sixth year. 16 hours. LITZENBERG.
- 63a,b. CLINIC IN OBSTETRICS AND GYNECOLOGY. Demonstrations, diagnosis, and treatment of cases in the Outpatient Department. Sections of class, sixth year. 12 hours. ADAIR and Assistants.

- 65a,b. CLINICS IN OBSTETRICS AND GYNECOLOGY. Demonstrations, diagnosis and treatment of cases. Conducted in Minneapolis City Hospital and City and County Hospital, St. Paul. Sections of class, sixth year. 24 hours. ADAIR, ROTHROCK, and Assistants.
- 67a,b. CLINICAL CLERKSHIPS. The direct observation of patients in hospital, under supervision; taking and recording of case histories; making provisional diagnoses; including parturition clinics in hospital and Outpatient Service; operations and manikin demonstrations. Sixth year, in sections. 32 hours. LITZENBERG and Associates.
- 69a,b. PARTURITION CLINICS. Conducted in the University Hospital and the Outpatient Service, at the Minneapolis City Hospital and the City and County Hospital, St. Paul. Students are on call for parturition cases; attendance required. No credits. Fifth and sixth years. ADAIR, RUTHERFORD, and Assistants.

ELECTIVE COURSES

- 101a,b. SEMINAR IN OBSTETRICS. Offering opportunities of advanced study. Limited to eight students. Sixth year. 16 hours. LITZENBERG.
- 103a,b. SPECIAL CLINICAL COURSE. A study in the diagnosis and treatment of diseases of women and of obstetrical conditions, at the Outpatient Department. Limited to four students. Sixth year. 36 hours. CONDIT.
- 105a,b. Same as above course. Fifth year. 8 hours. ADAIR.
- 107a,b. Same as above courses. Sixth year. 8 hours. ADAIR.
109. GYNECOLOGICAL CLINIC. A study in the diagnosis and treatment of diseases of women. Conducted in the St. Paul Dispensary. Two students. Sixth year. 16 hours. ROTHROCK.
- 111a,b. GYNECOLOGICAL CLINIC. Bedside studies in diagnosis and treatment of diseases of women. City and County Hospital, St. Paul. Fifth and sixth year. Limited to four students. 12 hours. JONES.
- 113a,b. CLINIC IN GYNECOLOGY AND OBSTETRICS. Bedside clinic at the Minneapolis City Hospital. Fifth or sixth year. Four students. 12 hours. MALAND.
115. CLINIC IN GYNECOLOGY AND OBSTETRICS. Course same as 111. SIMONS.
- †117. APPLIED ANATOMY OF THE PELVIS. Fifth year. 8 hours. LAVAKE.

† Discontinued during military service of instructor.

THE DEPARTMENT OF PEDIATRICS

Professor JULIUS PARKER SEDGWICK; Associate Professors JAMES T. CHRISTISON, WALTER R. RAMSEY; Assistant Professor FREDERIC W. SCHLUTZ; Instructors TOBIAS L. BIRNBERG, BRONSON CROTHERS,* EDGAR J. HUENEKENS, FREDERICK C. RODDA, MAX SEHAM, MILDRED ZIEGLER; Assistants WILLIAM D. BEADIE,* GLENN R. MATCHAN, CHARLES A. OLSON, NABOTH O. PEARCE, EUGENE F. WARNER; Teaching Fellow ALBERT G. ALLEY.

Departmental Office, Millard Hall

REQUIRED COURSES

- 101-102. DISEASES OF CHILDREN. The etiology, pathology, diagnosis and treatment of diseases peculiar to, or distinctive of, children, with particular emphasis upon their differences from adult type. Fifth year. 56 hours. SEDGWICK, CHRISTISON, RAMSEY.
- 102a,b. CLINIC IN PEDIATRICS. Conducted at the University Hospitals, the Minneapolis City Hospitals, Lymanhurst, and the City and County Hospital, St. Paul. Sections of class, fifth year. 16 hours. SEDGWICK, CHRISTISON, RAMSEY, SCHLUTZ, HUENEKENS, RODDA, and Assistants.
- 103a,b. CLINIC IN CONTAGIOUS DISEASES. Conducted in the Minneapolis City Hospital and the City and County Hospital, St. Paul. Sections of class, fifth year. 16 hours. CHRISTISON, RAMSEY, HUENEKENS, RODDA, and Assistants.
- 104a,b. CLINIC IN PEDIATRICS. An advanced clinical course, conducted at the University Hospital and affiliated hospitals. Sections of class, sixth year. 8 hours. SEDGWICK, CHRISTISON, RAMSEY, SCHLUTZ, HUENEKENS, RODDA.
- 105a,b. OUTPATIENT PEDIATRIC CLINIC. The practical study of the diseases of children in the Outpatient Service. Sections of class, sixth year. 12 hours. SCHLUTZ, SEHAM, and Assistants.

ELECTIVE COURSES

111. DISEASES OF THE NEW-BORN. The pathology and treatment of these disorders, with the presentation of illustrative cases. Limited to six students. Fifth or sixth year. 16 hours. SEDGWICK, PEARCE.
113. CONTAGIOUS DISEASES. The advanced study of contagious diseases, including the practice of intubation and tracheotomy, with training upon the cadaver. Fifth or sixth year. 16 hours. RAMSEY.

114. COURSE IN INFANT FEEDING. Conducted at the St. Paul Baby Welfare Clinic of the H. Amherst Wilder Charity. Sixth year. 24 hours. RAMSEY.
- 115a,b. THEORY AND PRACTICE OF INFANT FEEDING, INCLUDING DISEASES OF THE GASTRO-INTESTINAL TRACT. Limited to six students. In first three quarters, sixth year; in fourth quarter, fifth year. 8 hours. SCHLUTZ.
- 117a,b. CONGENITAL DEFECTS AND CONSTITUTIONAL DISORDERS OF INFANCY AND CHILDHOOD. Limited to six students. In each quarter. Fifth or sixth year. 8 hours. SCHLUTZ.
- 121a,b. PEDIATRIC CLINIC, OUTPATIENT DEPARTMENT. Limited to six students. Fifth or sixth year. 36 hours. SCHLUTZ, SEHAM.
- 125a,b. CLINIC IN CONTAGIOUS DISEASES. Conducted at the Minneapolis City Hospital. Limited to four students. Sixth year. 16 hours. SCHLUTZ.
- 127a,b. CLINIC IN CONTAGIOUS DISEASES. Conducted at the City and County Hospital, St. Paul. Limited to ten students. Course repeated in each quarter. Fifth or sixth year. 12 hours. RAMSEY, BIRNBERG.

DEPARTMENT OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

Professor FRANK C. TODD;* Associate Professor WILLIAM R. MURRAY; Assistant Professors FRANK E. BURCH,* JOHN S. MACNIE,* HORACE NEWHART; Instructors WALTER E. CAMP, HOWARD S. CLARK, WILLIAM W. LEWIS, WILLIAM E. PATTERSON, FRED J. PRATT, JOHN A. PRATT; Assistants EARL A. LOOMIS, G. ELMER STROUT, H. JOURNEY WELLES, Teaching Fellow VICTOR L. LANGENDERFER; Special Fellow FRANK N. KNAPP.

Departmental Office, Millard Hall

REQUIRED COURSES

79. OPHTHALMOLOGY AND OTOTOLOGY. Disorders and diseases of the eye and ear and their corrective, medical, and surgical treatment: Sixth year. 32 hours. TODD.
81. RHINOLOGY AND LARYNGOLOGY. The diagnosis and treatment of diseases of the nose and throat. Sixth year. 16 hours. MURRAY.

* On military service

- 83a,b. SECTION CLINICS IN EYE, EAR, NOSE, AND THROAT. Diagnostic and operative procedures in the clinics of the University Hospital, the Minneapolis City Hospital, and the City and County Hospital, St. Paul. Sixth year. 28 hours. TODD, MURRAY, BURCH, LEWIS.
- 85a,b. SECTION CLINIC IN DISEASES OF THE EYE. Study and treatment of cases in the Outpatient Service. Sixth year. 12 hours. MACNIE, CLARK, and Assistants.
- 87a,b. SECTION CLINIC IN DISEASES OF THE EAR. Study and treatment of cases in the Outpatient Service. Sixth year. 12 hours. NEWHART and Assistants.
- 89a,b. SECTION CLINICS IN DISEASES OF THE NOSE AND THROAT. Study and treatment of cases in the Outpatient Service, at three weekly sessions. Sixth year. 12 hours. MURRAY, PRATT, and Assistants.

ELECTIVE COURSES

- 115a,b. CLINIC IN DISEASES OF THE EYE. The examination of patients, diagnosis of disease conditions and supervised treatment. Alternate days, in the Outpatient Department. Sixth year. 36 hours. MACNIE and Assistants.
- 117a,b. CLINIC IN DISEASES OF THE EAR. Studies in examination of cases, diagnosis, and supervised treatment. Alternate days, at the Outpatient Department. Sixth year. 18 hours. NEWHART and Assistants.
- 119a,b. CLINIC IN DISEASES OF THE NOSE AND THROAT. The examination of patients, diagnosis of disease conditions and supervised treatment. Alternate days, at the Outpatient Department. Sixth year. 18 hours. MURRAY, PRATT, and Assistants.
- 121a,b. OPERATIVE CLINICS IN EYE, EAR, NOSE, AND THROAT. Conducted at the University Hospital. Course repeated in each quarter. Limited to ten students. Sixth year. 18 hours. TODD, BURCH, CLARK.
123. REFRACTION. A course of lectures. Required of all desiring the practical Course 125a,b. Sixth year. 8 hours. BURCH.
- 125a,b. PRACTICAL COURSE IN REFRACTION. Limited to ten students. Prerequisite: Course 123. Sixth year. 36 hours. BURCH, LOOMIS.
126. OPHTHALMOSCOPY. The principles and practice of this method of examination of the eye. Sixth year. 16 hours. MACNIE, CLARK.
- 127a,b. CLINIC IN DISEASES OF THE EYE. City and County Hospital, St. Paul. Limited to ten students. Fifth or sixth year. 12 hours. LEWIS.
- 201-202. SEMINAR IN OPHTHALMOLOGY AND OTO-LARYNGOLOGY. Sixth year. 48 hours. Staff.

THE DEPARTMENT OF SOCIAL SERVICE

Director, MARION A. TEBBETS

ELECTIVE COURSES

101. MEDICAL SOCIAL SERVICE. A study of interrelated physical, social, and industrial conditions affecting the individual health and demanding the service of the physician. The origin and purpose of medical social service. The social factors in household, industrial, and communal health. The community's health resources. Special medico-social problems. Lectures and laboratory field work. Limited to ten students. Offered in fifth or sixth year. 48 hours. TEBBETS.

THE SCHOOL OF CHEMISTRY

Associate Professors IRA H. DERBY, WILLIAM H. HUNTER; Instructor CARL L. SCHUMAN.

(Contributing courses to The Medical School)

- 13-14. MEDICAL ORGANIC CHEMISTRY. An outline of the chemistry of carbon, including the preparation of some of the more important organic compounds. Special emphasis is laid on the parts of organic chemistry most important in medicine. For third-year medical students who have not completed organic chemistry in the pre-medical years. 208 hours; six credits. HUNTER, SCHUMAN, and Assistants.
91. PHYSICAL CHEMISTRY. Special attention will be given to those divisions of the subject which have most application in the science of medicine, such as osmosis, colloidal solutions, chemical equilibria, etc. Third-year medical students. Two hours lectures; four hours of laboratory work, weekly. 96 hours; four credits. DERBY.

NOTE: For information regarding other available courses in Chemistry, see Bulletin, School of Chemistry.

DEPARTMENT OF ANIMAL BIOLOGY

Professors HENRY F. NACHTRIEB, HAL DOWNEY, CHARLES P. SIGERFOOS.

(Contributing elective courses to the Medical School)

36. RELATION OF INSECTS TO DISEASE. The causation and transmission of diseases by insects and other arthropods. Life history, habits, and methods of control of hominnoxious species. Three credits. RILEY.

117. PROTOZOOLOGY. Lectures, reference, and laboratory work on the structure and life histories of Protozoa. Special reference is paid to the relations of the Protozoa to diseases of animals. Three credits. SIGERFOOS.
- 123-124. BLOOD OF VERTEBRATES. A comparative study of blood and blood-forming organs of vertebrates. A portion of time to be devoted to research. Six credits. DOWNEY.

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1919/20

The Bulletin of the University of Minnesota

*The Medical School
Announcement for the Year
1919-1920*

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Act of October 3, 1917, authorized July 12, 1918*

1919							1920													
JULY							JANUARY							JULY						
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NOVEMBER							MAY							NOVEMBER						
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2	3	4	5	6	7	8	2	3	4	5	6	7	8	7	8	9	10	11	12	13
9	10	11	12	13	14	15	9	10	11	12	13	14	15	14	15	16	17	18	19	20
16	17	18	19	20	21	22	16	17	18	19	20	21	22	21	22	23	24	25	26	27
23	24	25	26	27	28	29	23	24	25	26	27	28	29	28	29	30	..	..	..	..
30	..	..	..	..	..	..	30	31	..	..	..	..	..	..	..	..	..	..	..	..
DECEMBER							JUNE							DECEMBER						
..	1	2	3	4	5	6	..	1	2	3	4	5	6	..	1	2	3	4	5	6
7	8	9	10	11	12	13	6	7	8	9	10	11	12	5	6	7	8	9	10	11
14	15	16	17	18	19	20	13	14	15	16	17	18	19	12	13	14	15	16	17	18
21	22	23	24	25	26	27	20	21	22	23	24	25	26	19	20	21	22	23	24	25
28	29	30	31	..	..	..	27	28	29	30	..	..	..	26	27	28	29	30	31	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

UNIVERSITY CALENDAR

1919-1920

1919			
September	20	Saturday	Payment of fees closes, except for new students
September	24-30	Week	Examinations for removal of conditions, and entrance examinations
September	30	Tuesday	Payment of fees for new students closes
September	29-30		Registration days
October	1	Wednesday	Fall quarter begins
October	16	Thursday	Senate meeting, 4:00 p.m.
November	27	Thursday	Thanksgiving Day; a holiday
December	18	Thursday	Senate meeting, 4:00 p.m.
December	23	Tuesday	Christmas vacation begins 9:00 p.m.
1920			
January	2	Friday	Christmas vacation ends 8:30 a.m.
January	2	Friday	Winter quarter begins
January	2	Friday	School of Embalming begins
February	12	Thursday	Lincoln's Birthday; a holiday
February	19	Thursday	Senate meeting, 4:00 p.m.
March	25	Thursday	Winter quarter ends
April	1	Thursday	Spring quarter begins
April	2	Friday	Good Friday; a holiday
May	20	Thursday	Senate meeting, 4:00 p.m.
June	13	Sunday	Baccalaureate service
June	16	Wednesday	Spring quarter closes
June	17	Thursday	Forty-eighth Annual Commencement
June	18-19		Registration days for summer quarter
June	21	Monday	Summer quarter begins
September	3	Friday	Summer quarter closes

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* In military service.

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FREDERICK W. SCHLUTZ, M.D., Assistant Professor of Pediatrics

† Deceased.

* In military service.

JOHN P. SCHNEIDER, M.D., Assistant Professor of Medicine
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* In military service.

† Deceased.

JOHN A. LEPAK, B.S., M.D., Instructor in Medicine
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CLYDE A. UNDINE, M.D., Assistant in Medicine
ARCHIBALD W. WARD, M.D., Assistant in Medicine
EUGENE F. WARNER, M.D., Assistant in Pediatrics

† Deceased.

* In military service.

H. JOURNEY WELLES, M.D., Assistant in Ophthalmology and Oto-Laryngology

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GENERAL INFORMATION

The thirty-second annual course of study in the Medical School begins October 1, 1919, and will cover a period of three quarters. With this year the School enters upon the four-quarter system. The fall quarter and the winter quarter, with a week's vacation intervening and following, occupy twelve weeks each; while the spring quarter and the summer quarter, of eleven weeks each, will be without intervening vacation, but will be followed by a month's vacation. For the present year, a summer session, commencing June 23, will be divided into two periods; the first of six weeks, and the second of five weeks.

Entering students will be admitted only at the commencement of the fall and winter quarters.

REQUIREMENTS FOR ADMISSION TO THE MEDICAL SCHOOL

At least two years, covering sixty semester credits or ninety quarter credits and earning sixty semester, or ninetyquarter honor points, of prescribed and elective study in the College of Science, Literature, and the Arts of this University, or of any other approved institution, are prerequisite to admission to the Medical School. The required academic studies, preliminary to Medicine are: Rhetoric, six semester credits; physics, six to eight credits; animal biology, six to eight credits; general chemistry, qualitative analysis, and organic chemistry, twelve to sixteen credits; and a reading knowledge of French or German, tested by the language requirement committee.

High-school or college Latin and psychology are recommended as studies preparatory to medicine.

This two or more years of collegiate study must lead, upon the satisfactory completion of one or two years of medical study, earning sixty credits and sixty honor points, to the Baccalaureate degree in science or in arts. Students holding the Bachelor's degree of any recognized college may submit credentials of practical equivalence in cultural studies, provided an adequate knowledge of biology, chemistry, and physics has been attained and a reading knowledge of French or German is demonstrated.

REGISTRATION

Registration is conducted under general University rules, in the offices of the Dean of the Medical School and of the Registrar. Entering students will appear before the Students' Work Committee for admission and classification. Students will not be permitted to register later than the tenth day from the opening of the semester, unless exceptional causes of delay are presented and are accepted by the Students' Work Committee.

On account of the present limited capacity of the Medical School, the registration of incoming (third-year) classes has been limited to ninety.

All applicants for admission will fill out and submit to the Dean's office an application form. These applications should be entered as soon as the candidate's entrance requirements are completed. If preparatory work has been done elsewhere than at the University of Minnesota application must be accompanied by certified credentials of high-school and college courses.

The Students' Work Committee will meet to consider applicants for admission at 9 a.m. on June 11, July 2, and August 1 and 15, 1919. A personal interview is required. Recommendations as to personal fitness, preparation, etc., must be submitted, with credentials.

Candidates will be selected with reference (a) to their full compliance with credit requirements; (b) to the quality of their preparatory work; (c) to their general knowledge; and (d) to their personal fitness. They will be submitted to competitive examinations as an aid in determining their comparative merits. These examinations will be held upon the dates given above. They will include tests of mental ability and general information. A physical examination is required.

Holders of the degree of B.A. or B.S. who have covered the required subjects, and those who have successfully completed two or three years of collegiate work, including full credits and required subjects, will be entitled, other things being equal, to first consideration for existing vacancies at the date of their application.

All other qualifications being equal, residents of Minnesota will be given prior opportunity in any vacancies existing at the date of their application. Only under exceptional circumstances will entrance conditions be permitted and, if allowed, they must be removed invariably before the opening of the succeeding school year.

FEES

The quarterly tuition fee in the Medical School is \$50, payable at the beginning of each quarter. No tuition fee is charged for the final hospital or advanced laboratory year.

A health service is maintained by the University and a health fee of \$2 per quarter is paid by each student.

A deposit of \$10 in the first year, and of \$5 in succeeding years, is required as a caution fee. This fee covers the cost of unnecessary damage to school buildings, of breakage and loss of laboratory apparatus and material, penalties for late registration or late payment of fees, fees for condition examinations, and rentals of post-office box and lockers. Any balance remaining from this deposit will be returned to the student at the close of each year.

Students who take less than the regular course of study may arrange their fees at the rate of \$2 for each weekly clock hour per quarter.

Repetition of work in course demands the repetitional payment of fees.

A fee of \$1 is payable for condition examinations; and one of \$5 for special examinations.

MICROSCOPES

Each student must be provided, upon admission, by purchase or rental, and throughout the entire four years' course, with a microscope of approved quality and equipment. Arrangements may be made through the Assistant Dean for the purchase of microscopes. Microscopes of suitable type cost, at the present time, from \$81 upwards. Students can not share a microscope.

In the fifth and sixth years students are required to provide themselves with a hemocytometer and a stethoscope of approved form.

COMBINED COURSES IN ARTS AND MEDICINE

Students who are candidates for the degree of Bachelor of Arts, who have successfully completed three years, or ninety semester or 135 quarter credits of work, fifteen credits being in starred courses, and who have won the required number of honor points in the College of Science, Literature, and the Arts, may elect their fourth year in the Medical School and secure the remaining thirty semester or forty-five quarter credits and the remaining thirty semester or forty-five quarter honor points, required for the Baccalaureate degree, in that School.

Similarly, students who have completed, with the required number of honor points, the work of the first two years, or sixty semester or ninety quarter credits, in the College of Science, Literature, and the Arts, or other approved college, may enter the Medical School and upon the successful conclusion of the first two years of medical study, earning the required sixty semester, or ninety quarter, credits and the like number of honor points, will receive the degree of Bachelor of Science. This degree must be earned before the beginning of the second clinical period, (the last quarter of the junior year).

Those who have received the B.A. or the B.S. degree before entering the Medical School must earn, nevertheless, a minimum of sixty semester, or ninety quarter honor points in the first two years of medical study. This is the equivalent of an average grade of C. The same average grade is required in the studies of the last two years.

It will be understood that in either of these combined courses the required subjects, viz.: rhetoric, chemistry, biology, physics, and a reading knowledge of French or German, must be included.

THE CURRICULUM

DEPARTMENTAL HOURS

	Hours		Hours
Physical Chemistry	99	Surgery	539
Anatomy, Gross and Microscopic	682	Obstetrics	286
Physiology, including Physiologic		Pediatrics	220
Chemistry	418	Ophthalmology and Oto-	
Bacteriology	176	Laryngology	121
Pathology, including Clinical		Roentgenology	11
Pathology and Hygiene.....	429	Electives	594
Pharmacology	143		
Medicine	715	Total	4,433

ELECTIVE STUDIES

Elective courses are offered in the fourth, fifth, and sixth years. These are listed under Departmental Statements.

Certain approved courses in animal biology, chemistry, etc., taught in other units of the University than the Medical School, may be taken as electives by medical students. These, also, are to be found in the departmental statements.

The general arrangement of studies is planned for the average student of medicine. The order of studies is not absolutely fixed. As wide a range of individual freedom is permitted as may prove consistent with systematic education. The Committee on Students' Work has authority, within due bounds of sequence of subjects, to adjust a student's program to his particular preparation, needs, and abilities. This liberty is not intended to suggest any departure from acknowledged standards.

MIGRATORY STUDENTS

Students migrating from recognized medical schools will present to the Registrar their official credentials of high-school and academic studies, which must be equivalent to those of this School. They will submit to the Students' Work Committee time and subject credits in medicine. They will present to the head of each department, in which they seek exemption or advanced standing, notebooks and records of scholarship in each subject. These may be accepted as of full value or may be supplemented by review examination, or by additional work at the discretion of the department. Subject credit, but not time credit, may be given for work done other than in a medical school. Special work will be arranged for students taking such subject credits to fill the full period required by law in medical study.

No advanced standing entitles the student to take two years of any graded study coincidentally.

REVISED PLAN OF CLINICAL TRAINING

With the initiation of the four-quarter system the Medical School will offer a revised method of clinical instruction which is designed to promote more individual training and more sustained opportunities of observation and experience in the clinical laboratory which the hospital affords.

To realize this plan, the primary divisions of clinical study, known as the junior and senior years, will be subdivided. The entire period of clinical instruction, covering ten quarters in time, will be arranged in four divisions.

1. An introductory clinical division of two quarters, within which students will take didactic and laboratory courses in medicine, surgery, obstetrics, and pediatrics; advanced work in applied pharmacology; and clinics devoted to studies in the general phenomena of disease and the principles of physical diagnosis.

2. An intermediate clinical division, of two quarters, in which the major emphasis will be placed upon clinical clerkships, wherein the students, under the supervision of resident instructors and teaching fellows, make and record physical examinations of patients and laboratory investigations of clinical material; and also attend general and special clinics and hospital rounds conducted by the departmental or divisional chiefs. At the same time, they will take lectures in the special branches of medicine, surgery, etc. The clinics in this period will be concentrated in the University Hospitals and out-patient service.

3. An advanced clinical division, also covering two quarters, the chief feature of which will be assignment to student internships in the University Hospitals, the Minneapolis City Hospitals, and the City and County Hospital of St. Paul. Students will be resident in these hospitals, but their work in the wards will be closely supervised by Faculty members of the hospital staffs. They will be kept in touch with the School by their attendance upon semi-weekly series of lectures upon advanced topics. Final examinations in all clinical branches will be held at the close of the student internship.

4. A regular internship division, covering four quarters, during which students will be registered as full interns in approved hospitals where their educational work will be supervised and certified to the School.

By the successive use of the four quarters of study in each year, the student may intensify his studies and may complete his clinical requirements in two and one half instead of three years. By the rotation of class sections, a group will be graduated at the close of each half year.

CURRICULUM*

Department and Course	Third (Freshman) Year			Fourth (Sophomore) Year		
	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	5th qtr.	6th qtr.
Anat. 5, 6 (Dissection).....	15	15	..	..	..	..
Anat. 103 (Histology).....	..	..	14	..	..	..
Anat. 107 (Embryology).....	..	..	9	..	..	..
Chem. 40 (Physical Chem.)...	9	..	..	..	..	..
Physiol. 100-102 (Physiol. Chem.)	6	6	6	..	..	..
Bact. 104 (Gen. Bact.).....	..	9	..	..	..	..
Anat. 111 (Neurology).....	..	..	..	9	..	..
Physiol. 103-4 (Physiology)...	..	..	..	11	11	..
Bact. 105 (Spec. Bact.).....	..	..	..	7	..	..
Path. 101-2 (Pathology).....	..	..	..	..	15	15
Pharm. 102-4 (Gen. & Exp. Pharm.)	..	..	..	..	..	9
Med. 50 (Phys. Diag.).....	..	..	..	..	..	2
Electives	..	..	..	6	6	6
Total hours per week....	30	30	29	33	32	32

* Figures represent actual hours each week. Schedule is subject to slight changes from quarter to quarter.

CURRICULUM*

Program of Studies Department and Course	Fifth Year				Sixth Year	
	First (Didactic) Clinical Period		Second (Clerkship) Clinical Period		Third (Student Internship) Clinical Period	
	7th qtr.	8th qtr.	9th qtr.	10th qtr.	11th qtr.	12th qtr.
Pharm. 105 (Pharm. & Ther.).	2	2	..	..	..	..
Pharm. 107 (Ther. Conf.).....	..	..	..	I	..	..
Pharm. 111 (Presc. Writing)...	..	..	I	..	..	..
Path. 103 (Clin. Path.).....	6	..	..	..	..	..
Path. 107 (Hygiene)	..	3	..	..	..	..
Med. 51-2 (Gen'l Med.).....	3	3	..	..	..	..
Med. 53 (Phys. Diagnosis)....	4½	4½	..	..	..	..
Med. 55 (Phys. Diag. Lects.)..	I	..	..	..	..	..
Med. 57 (Med. Clinic).....	I	I	..	..	..	..
Med. 63 (Med. Clinic).....	..	..	I	I	I	I
Med. 56 (Pract. Therapy).....	..	..	I	..	..	..
Med. 60, 62 (Jur. & Mth. Infec.)	..	..	..	..	2	..
Med. 69 (Nerv. Dis.).....	..	3	..	..	..	..
Med. 70 Psychiatry.....	..	..	..	..	..	I
Med. 79 (Dermatology).....	I	I	..	..	..	..
Surg. 53-4 (Prin. Surg.)	2	2	..	..	..	..
Surg. 51 (Gen'l Surg).....	..	3	..	..	..	..
Surg. 51 (Regional).....	2	2	..	..	..	..
Surg. 58 (Fractures).....	..	..	..	2	..	..
Surg. 59 (Diag. Clinic).....	½	½	..	..	..	..
Surg. 73 (Genito-Urinary)....	..	..	..	1½	..	..
Obst. 51-2 (Obstetrics).....	3	3	..	..	..	..
Obst. 53 (Gyn. Diag.).....	I	..	..	..	..	..
Obst. 58 (Obstetrics).....	..	..	3	..	..	2
Obst. 102-105 (Obs. & Gyn.)..	..	..	..	..	2	2
Ped. 100 (Diag. Clinic).....	½	½	..	..	..	..
Ped. 101 (Pediatrics).....	..	..	2	3	..	..
Oph. & Otol. 79 (Ophthal)...	..	..	2	..	..	..
Oph. & Otol. 80 (Otology)...	..	..	..	..	I	..
Oph. & Otol. (Rhin. & Laryng.)	..	..	..	1½	..	..
Roentgenology	..	..	..	..	..	I
Section Exercises	3	3	..	..	..	..
Clerkship, Sect. Clin., etc....	..	..	22	22	..	..
Student Internship†	..	..	..	..	25	25
Electives	6	6	6	6	6	6
Total	39½	37½	38	38	37	36

* Figures represent actual hours each week.

† A value of 25 hours a week is arbitrarily assigned to the student internships and is divided among the departments as follows: Medical, 10 hours; Surgery, 8 hours; Obstetrics, 3 hours; Pediatrics, 3 hours; and Ophthalmology-Oto-Laryngology, 1 hour.

EXAMINATIONS

The standing of students is determined by recitations, oral or written examinations, and review of laboratory or clinical notebooks. Examinations are usually held at the end of each quarter upon the courses closed within that period. Final standings are determined at the close of each quarter in conference of the heads of departments with the Students' Work Committee. Reports of such standings are filed in, and announced by the Registrar's Office.

A uniform marking system is operative throughout the University. Four passing grades, indicated by the symbols A, B, C, and D, represent differing degrees of merit. While a grade of D passes a student in an individual course, not less than an average of C is regarded as satisfactory work. The symbol E represents a condition, which may be removed by examination and by such supplementary work as the department imposing it may require. F stands for a failure and calls for a repetition of the work in class. I stands for incomplete and grants the student one month's time for the completion of the required work.

CONDITIONS

It is incumbent upon the student to remove a condition at the first opportunity offered. If not so removed it becomes a failure.

Conditions incurred in any quarter may be removed by examination at the close of the next succeeding quarter.

Any student, who, at the end of any given quarter receives grades of E or F in more than 50 per cent of his registered work in that quarter, will be indefinitely dropped for poor scholarship; such percentage to be estimated upon a credit hour basis. Any student so dropped will not be eligible to condition examination or to reinstatement excepting upon recommendation of the Students' Work Committee and affirmative vote of the Administrative Board.

REQUIREMENTS FOR GRADUATION

Compliance with the admission requirements; the prior attainment of the degree of Bachelor of Arts or Bachelor of Science, to which one year in medicine for the arts degree, and two years in medicine for the science degree, may contribute; the completion of the full four-year period of required and elective work in the Medical School; an approved hospital internship or advanced laboratory work or public health study for one year; and an unimpeached moral character, are the essentials for graduation.

The required internship insures to the practitioner of medicine a year of varied clinical experience under competent supervision and gives to the public a greater assurance of efficiency in the graduate. The alternative of advanced laboratory work serves to encourage men and women

of training who desire to enter the profession of medical teaching. The alternative of public health study meets a growing demand for trained medical sanitarians.

CLINICAL OPPORTUNITIES

THE UNIVERSITY HOSPITALS

The University is fortunate in the ownership and control of the University Hospital service. The Elliot Memorial Building, the product of a bequest of the estate of the late Dr. and Mrs. A. F. Elliot, supplemented by legislative appropriations, provides a present clinic of 192 beds.

The University Hospital system seeks the highest attainable results in the treatment of patients and the training of students. Its clinical service is closely coöperative with the laboratory departments. Its service is free and patients are admitted only upon the certificate of physicians of the state vouching for the applicant's inability to pay ordinary hospital charges and physician's fees, and stating the clinical character of the case.

A service building provides kitchens, dining-rooms, storerooms and quarters for domestic help.

The Out-Patient Department of the University Hospitals is housed in Millard Hall. Its service is open to free patients and is conducted by the clinical staff of the Faculty of the Medical School. It is subdivided into medical, surgical, gynecological, obstetrical, children's, eye, ear, nose and throat, skin, syphilis, genito-urinary, nervous and mental, and orthopedic clinics. It enrolled 15,163 new patients and received 54,044 patients' visits during the past year.

Sections of the senior and junior classes are assigned to these clinics daily and are trained in case-history taking, physical examinations and diagnosis, in prescription writing, and in general therapeutic methods.

THE SOCIAL SERVICE OF THE UNIVERSITY HOSPITALS

A Social Service Department has been established in relation to the hospital system and its out-patient clinics. In addition to the economic values it brings to the clinical service and the benefits which hospital and dispensary patients derive from a trained supervision extending to their homes, it offers opportunities of field work and social study to medical and sociological students.

AFFILIATED HOSPITALS

The Minneapolis City Hospitals and the City and County Hospitals of St. Paul are closely affiliated with the Medical School of the University. One half of their clinical service is under the direction of the Faculty. Attending and consulting staffs are appointed annually upon the recommendation of the Administrative Board of the School.

The combined resources of these two hospitals cover some 1,400 beds. Every phase of clinical service is represented and clinical material is utilized, so far as possible, by the School.

The State Hospital for the Crippled and Deformed, at Phalen Park, invites the Medical School to full participation in its clinical opportunities. Its superintending surgeon and his aides are members of the Faculty. Teaching Fellows and interns of the University Hospital are assigned in rotation to its service. It provides weekly clinics for divisions of the senior class.

Additional clinics are held in other institutions, as the Pillsbury House, the Glen Lake Sanatorium, and the St. Paul Free Dispensary.

LIBRARY

The library of the Medical School consists of the General Library, housed in Millard Hall, and of collections of books in the departmental libraries of Surgery, Obstetrics, Anatomy, and Pathology and Bacteriology. These departmental collections are readily available to students and investigators. The General Library is open from 9 a.m. to 10 p.m. Some 200 current journals are on file; 15,850 bound volumes and 32,859 unbound volumes and monographs, etc., are cataloged.

The libraries of other schools and colleges in the University and of the Hennepin County and Ramsey County Medical Societies are accessible to students of medicine.

PRIZES, FELLOWSHIPS, AND ASSISTANTSHIPS

The Rollin E. Cutts Prize in Surgery.—Dr. Martha Smith Cutts, '91 medical, established, some years ago, as a memorial to her husband, the late Dr. Rollin E. Cutts, a fund of \$500, the income of which is awarded, in the form of a gold medal, to the member of the senior class of the Medical School who presents the best thesis evidencing original work upon an approved surgical subject.

The Shevlin Fellowship.—A fellowship, representing the income of \$10,000, established in the Graduate School by the late Thomas H. Shevlin, is open to candidates for one full year's work in acceptable medical research. This fellowship has not been held during the past year.

Several student assistantships and, occasionally, fellowships in the fundamental departments, offer varying stipends.

THE SUMMER SESSION

The summer quarter for 1919 will be conducted in two periods: the first of six weeks' and the second of five weeks' duration. The session will immediately follow the commencement exercises in June.

Undergraduates in medicine are admitted in the Summer Session to courses of study offered for the following purposes: (1) to secure advanced standing in courses equivalent to those of the regular session; (2) to compensate for deficiencies in studies taken in other acceptable schools; (3) to remove conditions or failures in subjects which are equivalently covered in these courses; (4) to give opportunity for the concentration of medical study in the four quarters of the year.

For courses of instruction offered and schedule of tuition fees see circular of information of the Summer School.

THE GRADUATE SCHOOL IN MEDICINE

The Graduate School in Medicine has been established as a part of the main Graduate School of the University. It offers to suitably prepared graduates in medicine, courses covering two and three years, leading to the degree of Master of Science, Doctor of Philosophy, or Doctor of Science. The adequate training of specialists in medicine and in the laboratory branches is one of the main purposes of the school and for this purpose teaching fellowships, under annual stipends, have been created; with an additional number of graduate scholarships, under an abatement of tuition fees, to which selected graduate students receive appointment. Still other graduate students in medicine may be received under an annual tuition fee of \$50.

The field of graduate teaching in medicine has been extended to the inclusion of the opportunities for graduate study and medical research offered by the Mayo Foundation for Medical Education and Research, established at Rochester, Minnesota. Fellows and graduate scholars are assigned to courses of study both at the University and in the Foundation.

Students in the Medical School who have received the Baccalaureate degree from this or any other approved University may become candidates for the degree of Master of Arts, Master of Science, or Doctor of Philosophy in the Graduate School. They will pursue courses of study conforming to the regulations of the Graduate School.

Students registered in the Graduate School may elect majors or minors for the graduate degrees, for which advanced courses are provided, in anatomy, embryology, histology, neurology, pathology, bacteriology, physiology, physiologic chemistry and pharmacology, in the Medical School.

In all cases, students must comply with the rules and regulations of the Graduate School of the University of Minnesota, further information of which may be found in the announcement of the Graduate School or in the circular of information on graduate work in medicine. Application blanks for teaching fellowships and scholarships may be had upon request.

OPPORTUNITIES OF STUDY FOR PHYSICIANS

Physicians who desire to attend medical lectures and clinics for a limited period of time may obtain a visitor's ticket from the Dean. They may enter for regular lecture and clinical courses in the Medical School upon payment of a fee of \$10 for each semester. They may arrange for special courses of study in anatomy, physiology, experimental surgery, pathology, bacteriology, pharmacology, etc., at a fee of \$25 for each quarter, with additional charge for material used.

The School announces the semi-annual opportunity of Physicians' Clinic Days, during which a full program of clinics in the University Hospital, the out-patient service, and the allied municipal hospitals will be presented. Circulars of information of these occasions will be distributed.

THE SCHOOL FOR NURSES

The School for Nurses is a department of University instruction under the control of the Medical School. It is conducted in connection with the University Hospitals. It is in charge of a Superintendent, assisted by a committee of management and by a teaching staff selected from the Faculty of the Medical School. While the undergraduates of the School for Nurses constitute in part the nursing corps of the University Hospitals, the School exists primarily for the efficient education of the nurse. It is the first school for nurses in the United States organized under direct university control.

A four years' high-school course is the minimal requirement for admission. A six months' preliminary course in foundational studies is given before entry to the hospital service. The full course covers a period of three years. It leads to the degree of Graduate in Nursing conferred, upon the recommendation of the Faculty, by the Board of Regents.

Nurses in training are received from certain affiliated hospitals for the completion of their courses of study.

With the opening of the fall quarter a combined course in the College of Science, Literature, and the Arts and the School for Nurses will be offered. This course will cover a period of five years; the first two years, of three quarters each, in the College of Science, Literature, and the Arts; subjects being chosen with especial reference to the needs of students in nursing. This will be followed by a summer quarter, completing in the Medical School the specific preparation of the student for admission to the School for Nurses. In the ensuing two and one-half years, covering ten quarters, the student will be in residence at the University Hospital and will follow the graded course of training. A final period of two quarters will be devoted to elective work, either as a preparation for educational service or for public health service in nursing.

Courses in Public Health Nursing have been initiated in the School for Nurses during the past year. As an emergency measure, to meet community needs, emphasized by the war, preliminary courses, each covering a four months period have been given to suitably prepared students.

These will be replaced during the coming session by a well-developed course of study and training in public health nursing which, commencing with the fall quarter, will be continued through eight months. Preliminary courses, already taken, may be credited toward this more extended period of study. Graduate nurses and senior students of nursing, from approved schools and having the prerequisite of high-school preparation, will be eligible to admission.

The course will include the fundamental principles of public health nursing with field work in the several phases of practical service.

For further information, see Bulletin of the School for Nurses.

THE SCHOOL OF EMBALMING

With the coöperation of the State Funeral Directors' Association, a School of Embalming has been organized by the University and is conducted for a period of twelve weeks, commencing January 2, 1920. It is under the direction of a committee of the Administrative Board of the Medical School.

Didactic and laboratory instruction is given in anatomy, bacteriology, autopsies, chemistry, public health and sanitation, professional embalming, funeral management, and business principles. Certificates are issued to candidates successfully completing the course and are accepted for state license by the State Board of Health.

Circular of Information will be sent upon application.

DEPARTMENTAL STATEMENTS

THE DEPARTMENT OF ANATOMY

Professors CLARENCE M. JACKSON, JOHN B. JOHNSTON, THOMAS G. LEE, RICHARD E. SCAMMON; Associate Professor CHARLES A. ERDMANN; Assistant Professors ANDREW T. RASMUSSEN, JAY A. MYERS; Instructors GUSTAV J. NOBACK, HJALMAR L. OSTERUD; Teaching Fellows HELEN A. MACKEEN, FRANK L. ROBERTS, CHARLES K. ROYS.

Departmental Office, Institute of Anatomy

*REQUIRED COURSES

- 1w. ANATOMY FOR EMBALMERS. 55 hours. ERDMANN and Assistants.
- 2f,s. ELEMENTARY HUMAN ANATOMY. School for Nurses. 33 hours; 3 credits.† ERDMANN, NOBACK, MACKEEN.
- 5f,su; 6w,su. GROSS HUMAN ANATOMY. Dissection, including osteology. A disarticulated skeleton issued to every two students. Every student required to dissect lateral half of the body. Third-year medical students. 330 hours; 18 credits. JACKSON, ERDMANN, MYERS, OSTERUD.
- 9f-10w-11s. GROSS HUMAN ANATOMY. Dissection of the entire body, including osteology. Second-year dental students. 297 hours; 15 credits. ERDMANN, RASMUSSEN, and Assistants.
- 14w,su. HISTOLOGY AND EMBRYOLOGY. Minute structure and development of the tissues and organs. Second-year dental students. 99 hours; 6 credits. JACKSON, LEE, and Assistants.
- 103s,su. HUMAN HISTOLOGY. Microscopic study of the various tissues and organs. Third-year medical students. 154 hours; 9 credits. SCAMMON and Assistants.
- 107s,su. HUMAN EMBRYOLOGY. Development of the human body. Third-year medical students. Prerequisite: Course 103. 99 hours; 6 credits. SCAMMON, LEE, and Assistants.
- 111f,su. HUMAN NEUROLOGY. A study of the central nervous system and sense organs. Fourth-year medical students. Prerequisite: Courses 103, 107. 99 hours; 6 credits. JOHNSTON, RASMUSSEN, and Assistants.

* The letters f, w, s, and su indicate that the corresponding courses are offered in the fall, winter, spring, and summer quarters, respectively. Numbers joined by hyphen indicate that the course is continued through more than one quarter. Letters separated by commas indicate the repetition of the course in corresponding quarters.

† Credits, as stated in this bulletin, are on the quarter system; they are comparable with semester credits upon a ratio of three to two.

ELECTIVE COURSES

- 113f-114w-115s.* MAMMARY GLAND PROBLEMS. A special study of the mammary gland, human and comparative. Laboratory course. Hours and credits to be arranged. MYERS.
- 121f,s,su. ANATOMICAL TECHNIQUE. Microtechnique, reconstruction and museum methods, etc. Fourth-, fifth-, or sixth-year medical students. Limited to sixteen students. 66 hours; 3 credits. LEE.
- 126f,w,su. ADVANCED HISTOLOGY. A study of special preparations, including practice in the identification of unknown specimens. Fourth-, fifth-, or sixth-year medical, or graduate students. Limited to sixteen students. Prerequisite: Course 103. 33 hours. 1½ credits. RASMUSSEN.
- 129f-130w-131s.* TOPOGRAPHIC ANATOMY. Based upon a study of serial cross-sections of the human body. Fourth-, fifth-, or sixth-year medical, or graduate students. Prerequisite: Course 5-6. 33 hours; 2 credits. JACKSON.
- 133f,su. ANATOMY OF THE FETUS AND CHILD. A survey of prenatal and postnatal development. Fourth-, fifth-, or sixth-year medical, or graduate students. Limited to sixteen students. Prerequisites: Courses 5-6, 107. 66 hours, 4 credits. SCAMMON.
- 134f,s,su.* ANATOMY OF THE NEWBORN. A detailed laboratory study of the anatomy of the newborn. Fourth-, fifth-, or sixth-year medical, or graduate students. Prerequisite: Course 133, or equivalent. 66 hours, 3 credits. SCAMMON.
- 135f,su. PHYSICAL DEVELOPMENT OF CHILDHOOD. Lectures, with study of illustrative material. Primarily for students in the College of Education; open to medical students by permission of instructor. 22 hours, 2 credits. SCAMMON.
- 137f-138w-139s-140su.* IMPLANTATION AND PLACENTATION. Study of the implantation of the ovum, formation of the placenta, and the earlier stages of embryonic development in man and mammals. Fourth-, fifth-, or sixth-year medical, or graduate students. Limited to twelve students. Prerequisite: Course 107, or equivalent. 66 hours; 3 credits. LEE.
- 143s. APPLIED ANATOMY. Relationships, with reference to their clinical applications. Fourth-, fifth-, or sixth-year medical, or graduate students. Prerequisite: Course 5-6. 33 or 66 hours; 1½ or 3 credits. ERDMANN.

* These courses may be taken continuously through three or four quarters or in any one quarter.

- 145f-146w-147su.* **SPECIAL DISSECTIONS.** Dissections of special regions, including preparation of museum specimens. Fourth-, fifth-, or sixth-year medical, or graduate students. Limited to twenty-four students. Prerequisite: Course 5-6. 33 hours; 1½ credits. ERDMANN.
- 149w. **EXPERIMENTAL NEUROLOGY.** A study of the morphology of the central nervous system as determined by experimental methods. Fifth-, or sixth-year medical, or graduate students. Limited to five students. Prerequisite: Course III. 66 hours; 3 credits. RASMUSSEN.
- 153f-154w-155s-156su.* **ADVANCED ANATOMY.** Advanced work, largely individual in character, in gross anatomy, histology, embryology, or neurology. Fourth-, fifth-, or sixth-year medical, or graduate students. Admission only upon approval of instructor. Hours and credits to be arranged. JACKSON, JOHNSTON, LEE, RASMUSSEN, SCAMMON.
- 160f, 162s, 163su.* **SEMINAR IN GROWTH OF CHILDREN.** A study with graphic analysis of data on physical development of children of school age. Prerequisite: Course 135, or equivalent. Hours and credits to be arranged. SCAMMON.
- 201f-202w-203s-204su.* **RESEARCH IN ANATOMY.** Research work in gross or microscopic anatomy, neurology, histology, or embryology, for properly qualified students, graduates, or others, upon approval of any one of the instructors. Hours and credits to be arranged. JACKSON, JOHNSTON, LEE, RASMUSSEN, or SCAMMON.
- 205f-206w-207s.* **ANATOMICAL SEMINAR.** Presentation and discussion of research work in progress in the department, together with reviews of current anatomical literature. Open to graduates or others upon approval of instructor. 11 hours; 1 credit. JACKSON.

THE DEPARTMENT OF PHYSIOLOGY

Professors ELIAS P. LYON, FREDERICK H. SCOTT; Associate Professors RICHARD OLDING BEARD, J. F. MCCLENDON; Assistant Professors FRANCIS B. KINGSBURY, CHAUNCEY J. V. PETTIBONE, M. RUSSEL WILCOX; Instructor ESTHER GREISHEIMER; Assistant CHARLES C. GAULT.

Departmental Office, Millard Hall

REQUIRED COURSES

1f-2w-3s. **PHYSIOLOGY AND HYGIENE.** A course offered especially to teachers, designed to give a helpful knowledge of the human subject. Lectures and laboratory work. 3 hours on Saturday; 6 credits. LYON, BEARD, and Assistants.

- 4f,w,s,su. HUMAN PHYSIOLOGY. A course offered to students of the College of Science, Literature, and the Arts, of the School for Nurses, the Division of Home Economics, the College of Dentistry, etc. Lectures and laboratory work. Prerequisites: elementary biology and chemistry. 88 hours; 6 credits. LYON, BEARD, GREISHEIMER, and Assistants.
- 5f,w,s,su. Same as Course 4 without laboratory work. Pharmacy students and others. 4 credits. LYON, BEARD, and Assistants.
- 6s,su. PHYSIOLOGIC CHEMISTRY. For students of College of Dentistry and others. Prerequisite: organic chemistry. 55 hours; 3 credits. PETTIBONE and Assistants.
- 100f-101w-102s; 100, 101, 102su. PHYSIOLOGIC CHEMISTRY. The components of the animal body; foods, digestion, the excreta and metabolism. Third-year medical students and others. Prerequisite: organic chemistry. 198 hours; 12 credits. PETTIBONE, KINGSBURY, GREISHEIMER, and Assistants.
- 103f,su. PHYSIOLOGY OF MUSCLE, NERVE, BLOOD, CIRCULATION, AND DIGESTION. Fourth-year medical students and others. Prerequisites: organic chemistry and animal biology. 121 hours; 8 credits. SCOTT, MCCLENDON, and Assistants.
- 104w,su. PHYSIOLOGY OF THE NERVOUS SYSTEM AND SPECIAL SENSES; RESPIRATION, METABOLISM, NUTRITION, AND EXCRETION. Fourth-year medical students and others. Prerequisites: organic chemistry and animal biology. 121 hours; 8 credits. LYON, SCOTT, BEARD, MCCLENDON, and Assistants.

ELECTIVE COURSES

- 110f. PHYSICAL CHEMISTRY OF VITAL PHENOMENA. Osmotic pressure, surface tension, electric conductivity, hydrogen-ion concentration. Prerequisites: animal biology and two courses in chemistry. 66 hours; 3 credits. MCCLENDON.
- 111w. ELECTRO PHYSIOLOGY. The bio-electric currents, negative osmosis and further work on hydrogen-ion concentration. Prerequisite: 110f or arrange. 66 hours; 3 credits. MCCLENDON.
- 112s. VITAMINES. Physico-chemical conditions necessary for the preservation of the vitamins during the storage, cooking, or other preparation of foods. Prerequisites: 111w. 66 hours; 3 credits. MCCLENDON.
- 113f,w,s,su. PROBLEMS IN PHYSIOLOGY. Arranged by instructors with qualified students. Each student will be assigned a topic for special laboratory study, leading in some cases to original investigation. Conferences and reading. Prerequisites: Courses 103-4 or equivalent. 66 hours; 3 credits. LYON, SCOTT, MCCLENDON.

- 131w. ADVANCED PHYSIOLOGY OF MUSCLE, BLOOD, CIRCULATION, AND DIGESTION. Alterations due to physiologic conditions. Fourth-, fifth-, or sixth-year medical students, and others. Prerequisite: Physiology 103. 66 hours; 3 credits. SCOTT.
- 132s. ADVANCED PHYSIOLOGY OF RESPIRATION, EXCRETION, METABOLISM, NERVOUS SYSTEM, AND SENSE ORGANS. Conferences and laboratory work. Fourth-, fifth-, or sixth-year medical students, and others. Prerequisite: Physiology 104. 66 hours; 3 credits. SCOTT.
- 137f,s. FOODS AND PRACTICAL DIETETICS. A study of human foods and food values; of the principles of food selection; of caloric indices and balanced dietaries. Exercises in the practical preparation of foods. Fourth-, fifth-, or sixth-year medical students. Limited to twelve students. 66 hours; 3 credits. BEARD, THOMAS.
- 138w. PHYSIOLOGY OF DEVELOPMENT. The physiology of the ovum, embryo, fetus; the functions of menstruation, ovulation, pregnancy, parturition, and lactation; the functional characteristics of birth, infancy, childhood, adolescence, maturity, and old age. Fourth-, fifth-, or sixth-year medical students. 22 hours; 2 credits. BEARD.
- 139s. EXAMINATION OF THE EYE AND EAR. A study of advanced methods. Lectures, demonstrations, and laboratory exercises. Fourth-, fifth-, or sixth-year medical students. Prerequisite: Physiology 104. 22 hours; 1 credit. WILCOX.
- 153f,w,s,su. ADVANCED PHYSIOLOGIC CHEMISTRY. Course arranged by instructors with qualified students for special work. Fourth-, fifth-, or sixth-year medical students and others; may be taken in one or more quarters. Prerequisite: Course 102. Hours and credits arranged. PETTIBONE, KINGSBURY.
- 161f. URINALYSIS. Advanced methods. Fourth-, fifth-, or sixth-year medical and other qualified students. Prerequisite: Physiology 102. 66 hours; 3 credits. PETTIBONE.
- 162w. CHEMICAL ANALYSIS OF BLOOD. The most recent methods in chemical analysis of blood, including total nitrogen, total non-protein nitrogen, urea, uric acid, creatinin, cholesterol, chlorides, sugar, and various other constituents. Limited to twelve students. Prerequisite: Physiology 102. 66 hours; 3 credits. PETTIBONE.
- 163s. METABOLISM. Lectures and laboratory work on special phases of metabolism. Lectures may be taken alone; number of students unlimited; laboratory course limited to ten students. Fourth-, fifth-, or sixth-year medical students, and others. Prerequisite: Physiology 102. 66 hours; 3 credits. PETTIBONE.
- 164f,w,s. QUANTITATIVE METHODS. The estimation of certain important substances in the urine, blood, and other body fluids. Fourth-, fifth-,

or sixth-year medical students and others. Prerequisite: Physiology 102. Hours and credits arranged. KINGSBURY.

201f,w,s. SEMINAR IN PHYSIOLOGY AND PHARMACOLOGY. For instructors and advanced students. 11 hours; 1 credit. LYON, HIRSCHFELDER, and Staff.

203f,w,s. RESEARCH IN PHYSIOLOGY. Hours and credits arranged. LYON, SCOTT, MCCLENDON.

205f,w,s. RESEARCH IN PHYSIOLOGIC CHEMISTRY. Hours and credits arranged. KINGSBURY, PETTIBONE.

208f, 209w. SEMINAR IN PHYSIOLOGIC OPTICS. Primarily for graduate students. Open to sixth-year medical students. 11 hours; 1 credit. LYON.

210f, 211w. PHYSIOLOGIC OPTICS. A laboratory course. For graduate and sixth-year medical students. 22 hours; 1 credit. LYON.

DEPARTMENT OF PHARMACOLOGY

Professor ARTHUR D. HIRSCHFELDER; Associate Professor EDGAR D. BROWN; Assistant CHARLES E. GREENLAW; Teaching Fellow JOHN P. QUIGLEY.

Departmental Office, Millard Hall

REQUIRED COURSES

1f,w. ELEMENTARY PHARMACOLOGY. A study of the history, uses, classification, and preparation of drugs; definition of descriptive terms; systems of weights and measures; methods of administration, principles of dosage, etc. For School for Nurses and others. 44 hours; 4 credits. BROWN.

4s. COURSE IN PHARMACOLOGY. The history, origin, nature, pharmacal preparations, and uses of drugs, including the discussion of their physiologic, pharmacologic, and therapeutic actions. For second-year dental students. 44 hours; 4 credits. HIRSCHFELDER.

102f,s. GENERAL PHARMACOLOGY. The principles underlying the structure, physico-chemical properties, physiologic, therapeutic, and toxic actions of substances, natural or synthetic, used as medicines. Fourth-year medical students. 44 hours; 3 credits. HIRSCHFELDER, BROWN.

104f,s. EXPERIMENTAL PHARMACOLOGY. Exercises illustrating the preparation and action of medicines, their relation to chemical structure, and their mode of administration. Fourth-year medical students. 66 hours; 3 credits. HIRSCHFELDER, BROWN.

- 105su,w. GENERAL PHARMACOLOGY AND THERAPEUTICS. A detailed study of drugs important in clinical practice, covering the relations of chemical structure to physiologic and therapeutic action and modes of application in medicine. Part I. Fifth-year medical students. 22 hours; 2 credits. HIRSCHFELDER, BROWN.
- 106f. GENERAL PHARMACOLOGY AND THERAPEUTICS. Same as Course 105, in continuation. Part II. Fifth-year medical students. 22 hours; 2 credits. HIRSCHFELDER, BROWN.
- 107f,w,s. THERAPEUTIC CONFERENCE. Discussion of the treatment of diseases based upon a study of notes of typical cases, in connection with the clinical clerkship in medicine. Section of sixth-year class in each quarter. 11 hours. HIRSCHFELDER.
111. PRESCRIPTION WRITING. The principles of prescription writing; studies in the flavoring, coloring, and incompatibles of drugs. Fifth-year. 11 hours. BROWN.

ELECTIVE COURSES

6. EXPERIMENTAL PHARMACOLOGY. Experiments upon the effects of the important heart and nerve stimulants, sedatives, purgatives, and antiseptics. Offered to dental and pharmacy students and nurses. 22 to 44 hours; 1-2 credits. HIRSCHFELDER, BROWN.
109. PHARMACOLOGICAL PROBLEMS. An intensive experimental study of some single topic in pharmacology, with a critical review of the literature bearing upon the subject. Hours and credits arranged. HIRSCHFELDER, BROWN.
201. SEMINAR IN PHYSIOLOGY AND PHARMACOLOGY. Reviews of recent literature bearing upon physiologic and pharmacologic subjects. Conducted by department directors, with the collaboration of the staffs and of qualified graduate or undergraduate students. 11 hours; 1 credit.
203. RESEARCH IN PHARMACOLOGY. Open to graduate and advanced students. Hours and credits arranged. HIRSCHFELDER, BROWN.

THE DEPARTMENT OF PATHOLOGY AND PUBLIC HEALTH

Professors HAROLD E. ROBERTSON, JOHN SUNDWALL; Associate Professor ELEXIOUS T. BELL; Assistant Professor MOSES BARRON; Instructor MARGARET WARWICK.

Departmental Office, Institute of Public Health and Pathology

REQUIRED COURSES

- 4f. PATHOLOGY. The study and recognition of gross and microscopic disease processes. The principles of general pathology with special

consideration of diseases peculiar to the mouth and teeth and important in dental practice. Dental students. 99 hours; 6 credits. HENRICK, WARWICK, and Assistants.

101f,w. *PATHOLOGY*. Part I. The general principles governing pathologic changes, including disturbances of the circulation and metabolism; inflammation, regeneration, and repair; tumor formation. The study and recognition of gross and microscopic lesions. Fourth-year medical students. Prerequisites: histology and special bacteriology. 164 hours; 9 credits. ROBERTSON, BELL, BARRON.

102w,s. *PATHOLOGY*. Part II. The study of the pathologic processes of infectious diseases, such as diphtheria, typhoid fever, etc.; the special pathology of lesions in various organs, systems of organs, and tissues of the body. Fourth-year medical students. Prerequisite: Pathology, Part I. 164 hours; 9 credits. ROBERTSON, BELL, BARRON.

103su,f,s. *CLINICAL PATHOLOGY*. The principles and methods involved in the examination of urine, blood, stomach contents, feces, sputum, exudates, and transudates; the relation of pathologic findings to the diagnosis of disease. Fifth-year medical students. 66 hours; 4 credits. BARRON, WARWICK.

107su,w. *PREVENTIVE MEDICINE AND HYGIENE*. A systematic study of the principles of personal and communal hygiene and of general procedures for the protection of the public health. Sixth-year medical students. 33 hours; 3 credits. SUNDWALL.

109f,w,s. *CLINICAL PATHOLOGY*. Practical work in the examination of blood, urine, stomach contents, sputum, etc. Conducted in the Out-Patient Department with class sections. Sixth-year medical students. 11 hours. One-half credit. BARRON, WARWICK,

111f,w,s. *AUTOPSIES*. Technique of performing autopsies; making autopsy records; examination of fresh organs removed from these autopsies. Opportunities afforded to study observed lesions microscopically. Three or four students called to each post-mortem; excused from regular classes. Preference given to senior students. Each candidate for the degree must have taken part in at least four autopsies. Fifth- and sixth-year medical students. The Staff.

*ELECTIVE COURSES

108. *ADVANCED CLINICAL PATHOLOGY*. Practical studies on spinal fluids, including colloidal gold and Nonne reactions, and other special methods for examination and diagnosis of body tissues and fluids.

* Assignment of elective courses to individual staff members will appear in quarterly programs.

110. PRACTICAL WORK IN HISTOPATHOLOGY. Exercises in examinations of microscopic material from autopsies and operations.
112. PATHOLOGIC TECHNIQUE. General and special methods of preparation of microscopic and gross pathologic specimens; including practice with freezing microtome, celloidin and paraffin embedding methods, general and special stains, preparation of museum specimens, etc. Limited to ten students. Fourth-, fifth-, and sixth-year medical students. Prerequisite: pathology, Part I. 33 hours; $1\frac{1}{2}$ credits.
- 113f,w,s. ADVANCED PATHOLOGY. Laboratory studies in the examination of routine operative and autopsy specimens, with investigation of special associated problems. Credit for work in this course is to be judged entirely by character and amount of work accomplished. Dates and hours arranged.
117. DIAGNOSIS OF TUMORS. Rapid diagnosis and study of tumors and other pathologic conditions simulating tumor formation. Fifth- and sixth-year medical students. Prerequisite: pathology, Part II. 33 hours; $1\frac{1}{2}$ credits.
118. GYNECOLOGICAL PATHOLOGY. The special study of pathologic conditions found in the female genital tract. Fourth-, fifth-, or sixth-year medical students. 48 hours; $1\frac{1}{2}$ credits. BELL, ADAIR.
119. CLINICAL PATHOLOGICAL CONFERENCE. Presentation and comparison of clinical data on selected cases by clinicians, and of the pathological specimens from these same cases, by the pathologist, with discussions of the problems of etiology and diagnosis. One hour per week in each quarter.
120. NEUROPATHOLOGY. The special study of pathologic conditions of the central and peripheral nervous system. Fourth-, fifth-, or sixth-year medical students. 22 hours; $1\frac{1}{2}$ credits.
121. CLINICAL LABORATORY COURSE. Practical diagnostic study in the Out-Patient Department laboratory. Limited to sections of four students. Fifth- or sixth-year medical students. 33 hours; $\frac{1}{2}$ credit.
123. SURGICAL PATHOLOGY. Studies in the gross and microscopic characters of surgical material with conferences on, and discussion of, practical questions of etiology, diagnosis, and treatment. 33 hours, $1\frac{1}{2}$ credits.
124. HEMATOLOGY. Advanced studies in diseases of the blood, with particular attention to special technical procedures and the significance of laboratory findings. Fifth- or sixth-year medical students. 44 hours; 2 credits.
201. RESEARCH. Graduate students, of the necessary preliminary training, may elect research, either as majors or minors in pathology. Hours and credits to be arranged.

DEPARTMENT OF BACTERIOLOGY AND IMMUNOLOGY

Professor WINFORD P. LARSON; Assistant Professor ARTHUR T. HENRICI;
Instructor ANNE BENTON; Assistant ROBERT C. GREEN.

Departmental Office, Institute of Public Health and Pathology

REQUIRED COURSES

- 3f. BACTERIOLOGY. The principles governing the isolation and study of bacteria. The bacteria and other parasites of the mouth and teeth. Studies of pathogenic organisms which produce, or appear in, rheumatism; relation to infections of the teeth. Dental students. 99 hours; 5 credits. HENRICI and Assistants.
- 6f,w,s. ELEMENTARY BACTERIOLOGY. The principles and technique of general bacteriology. Studies in the morphologic and biologic characters of the common bacteria. Preparation of culture media. Disinfectants and disinfection. Bacteriology of water and food products. Students of Home Economics, Agriculture, Nursing, etc. 88 hours; 4 credits. BENTON and Assistants.
- 104w,su. GENERAL BACTERIOLOGY. The preparation of culture media; the morphology of bacteria; methods of staining and identification; anaerobic bacteria; principles of sterilization and disinfection; examination of air, water, milk; relation of bacteriology to the industries. Third-year medical students and others. Prerequisites: general chemistry, botany or zoology. 99 hours; 6 credits. LARSON, BENTON, and Assistants.
- 105su,f. SPECIAL BACTERIOLOGY. The study of pathogenic bacteria, especially in relation to definite diseases; bacteriological methods in clinical diagnosis; principles of infection and immunity, with practical application of serum reactions. Fourth-year medical students and others. Prerequisite: general bacteriology. 77 hours; 5 credits. LARSON, BENTON, and Assistants.

ELECTIVE COURSES

114. ADVANCED BACTERIOLOGY. An advanced course giving additional work in bacteriology and the opportunity of working out special problems. Fifth-year medical students. Limited to ten students. 44 hours; 2 credits. LARSON.
115. COURSE IN IMMUNITY. Laws of hemolysis. Quantitative relationship between antigen and antibody. Wassermann reaction. Opsonins. Vaccines. Precipitin reaction. Abderhalden reaction. Anaphylaxis. Fifth- and sixth-year medical students. Limited to ten students in each quarter. 44 hours; 2 credits. LARSON.

117. THE HIGHER BACTERIA. Study of morphology, cultivation, and classification of trichomycetes, yeasts, and moulds. Study of the mycoses. Limited to six students. HENRICI.
203. RESEARCH. Graduate students of the necessary preliminary training may elect research, either as majors or minors, in bacteriology. Hours and credits arranged. LARSON.

DEPARTMENT OF SURGERY

Associate Professor ARTHUR C. STRACHAUER;* Professor ARTHUR J. GILLETTE; Associate Professors ALEXANDER R. COLVIN, J. FRANK CORBETT, ARTHUR A. LAW, ARCHIBALD MACLAREN, ARTHUR T. MANN, HARRY P. RITCHIE, JOHN T. ROGERS; Assistant Professors PAUL F. BROWN, CARL C. CHATTERTON, LOUIS E. DAUGHERTY, EMIL S. GEIST, JAMES W. GEORGE, JAMES A. JOHNSON, OSCAR OWRE, FREDERICK H. POPPE, CHARLES A. REED, ARCHA E. WILCOX, FRANKLIN R. WRIGHT, HARRY B. ZIMMERMAN; Instructors JOHN S. ABBOTT, WALLACE COLE, WALTER A. FANSLER, PAUL W. GIESSLER, EUGENE K. GREEN, HUGO J. HARTIG,* JOHN P. HIEBERT, WALTER J. KREMER, FREDERICK A. OLSON, EMIL C. ROBITSHEK, JOHN C. STALEY, HENRY C. STUHR, GILBERT J. THOMAS, ANTON G. WETHALL; Assistants CHARLES A. HALLBERG, M. KELLER KNAUFF, MANFORD O. OPPEGAARD, JOSEPH J. STRATTE, EDWARD A. ZAWORSKI; Teaching Fellows DONALD S. CAMERON, ARTHUR A. ZIEROLD.

Departmental Office, Millard Hall

REQUIRED COURSES

- 51f-w; s-su. PRINCIPLES OF SURGERY. A study of surgical inflammations, etc.; illustrated by gross and microscopic preparations from the living subject and from experimental courses. Lectures and demonstrations. Fifth year. 44 hours. CORBETT, RITCHIE.
- 53f,s. GENERAL SURGERY. The diseases and injuries of tendons, fasciae, bursae, blood vessels, nerves, brain, and meninges. Lectures and demonstrations. Fifth year. 33 hours. LAW.
- 55f-w; s-su. REGIONAL SURGERY. The practical surgery of the several regions of the body; diseases of bones, injuries, and acute diseases of joints, etc. Lectures and demonstrations. Fifth year. 44 hours. STRACHAUER.
- 58w. FRACTURES AND DISLOCATIONS. Lectures and demonstrations. Sixth year. 22 hours. LAW, DAUGHERTY, WILCOX.

* Acting Chief of the Department.

- 59f,w,s,su. **DIAGNOSTIC CLINIC.** A series of clinics upon the diagnosis of surgical conditions as presented in the hospital wards. 11 hours. Fifth year. JOHNSON.
- 63f,w,s,su. **CLINICAL CLERKSHIPS.** The personal and direct study of assigned hospital patients under supervision of the staff; case histories; laboratory examinations; provisional diagnoses, with suggestions as to therapy. Practical instruction in anesthesia and a demonstration of anesthetics. 88 hours. The Staff.
- 65f,w,s,su. **MINOR OPERATIVE CLINICS.** Course conducted with class sections on three days in each week at the Out-Patient Department; a part of the course of required clinics. 17 hours. JOHNSON and Staff.
- 66s. **MEDICAL ETHICS AND ECONOMICS.** 2 hours. AMOS W. ABBOTT, ARCHIBALD MACLAREN.
- 67f,w,s,su. **OPERATIVE COURSE ON THE CADAVER.** The technique of abdominal incision and closure; of bowel suturing; appendiceal removal; kidney exploration; nephrotomy; tracheotomy; amputations; ligations; and other problems in emergency surgery. Fifth year. 22 hours. CORBETT, POPPE.
- 68f,w,s,su. **ANIMAL SURGERY.** A study of surgical technique by cardinal operations upon animals. Sixth year. 33 hours. CORBETT, POPPE.
- 69f,w,s,su. **STUDENT INTERNSHIP.** A course of resident study in an assigned hospital, covering the last two quarters of the senior year, under direction of the faculty members of the hospital staff; section of surgery. 176 hours. The Staff.

ORTHOPEDIA

- 70f,w,s,su. **ORTHOPEDIC SURGERY.** A course of clinical lectures and operations conducted in each quarter, with divisions of class; at the Hospital for Crippled and Deformed at Phalen Park. 22 hours. GILLETTE, CHATTERTON.
- 71f,w,s,su. **ORTHOPEDIC CLINIC.** A study of cases of orthopedic disease and treatment at the Out-Patient Department, with class sections; a part of the course of required clinics. 8 hours. GEIST, REED.

UROLOGY

- 73f. **GENITO-URINARY DISEASES.** The etiology, diagnosis, and treatment of this group of diseases. A course of lectures. 17 hours. WRIGHT.
- 77f,w,s,su. **GENITO-URINARY CLINIC.** The observation, examination, and treatment of patients in the Out-Patient Service at three weekly sessions; a part of the course of required clinics. 8 hours. OWRE and Staff.

*79f,w. COURSE IN ROENTGENOLOGY. Lectures, demonstrations, and plate reading. 11 hours. BISSELL.

†ELECTIVES

- 101, 101x, 101y. MINOR SURGERY. Clinical courses, conducted coincidentally, in the Out-Patient Department. JOHNSON, ROBITSHEK, STRATTE.
102. PROCTOSCOPY AND SIGMOIDOSCOPY. A clinical course conducted in the Out-Patient Department. FANSLER.
103. SURGICAL RESEARCH. For advanced students. Hours and credits arranged. CORBETT, POPPE.
- 104, 104x, y, yy, z. DIAGNOSTIC AND OPERATIVE PROCEDURES. Conducted at the University Hospital. The Staff.
- 105, 105x. DIAGNOSTIC AND OPERATIVE CLINICS. Held at Minneapolis City Hospital. MANN, WILCOX, and Staff.
106. EXTRACTION OF TEETH. Course conducted in the College of Dentistry. GRIFFITH.
107. GENITO-URINARY CLINIC. At University Dispensary. OWRE and Staff.
108. ENDOSCOPY AND CYSTOSCOPY. A clinical course at the Minneapolis City Hospital. OWRE.
109. GENITO-URINARY CLINIC. Conducted at the Minneapolis City Hospital. WRIGHT, OWRE.
- 110w. ORTHOPEDIC CLINIC. At the University Dispensary. GEIST, REED.
- 117w. ORTHOPEDIA. A course of lectures illustrated by lantern slides. GEIST.
- 215w,s. THE SURGERY OF THE KIDNEY. A review of the embryology, anatomy, and pathology. Diagnosis; cystoscopic study, including kidney function estimation, and pyelography. Operative technique. Studies of special problems. STRACHAUER.
- 216w-217s. THE SURGERY OF THE BRAIN AND SPINAL CORD. Operative technique. Studies of special problems. Prerequisites: Anatomy 103; Medicine 113. STRACHAUER.

* While this course is not departmentalized, it is most appropriately listed in the group of surgical studies.

† All clinical electives will be the subject of special registration. They are open generally to fifth- and sixth-year students and in all quarters. Length of courses will be announced by special programs covering each elective period.

DEPARTMENT OF MEDICINE

Professors LEONARD G. ROWNTREE, ARTHUR S. HAMILTON,* S. MARX WHITE, ARTHUR A. SWEENEY; Research Professor THOMAS B. HARTZELL; Associate Professors FRANCIS G. BLAKE, JAMES S. GILFILLAN, SAMUEL E. SWEITZER, HENRY L. ULRICH; Assistant Professors JOHN BUTLER, CHARLES D. FREEMAN, ALEXANDER R. HALL, ERNEST M. HAMMES, HARRY G. IRVINE, ANGUS W. MORRISON, GEORGE M. OLSON, ERNEST T. F. RICHARDS, ROBERT I. RIZER, JOHN P. SCHNEIDER, GRETE E. SEHAM; Lecturer HENRY WIREMAN COOK; Instructors ARCHIBALD H. BEARD, PAUL B. COOK, CHARLES R. DRAKE, EDWIN L. GARDNER, OLGA S. HANSEN, JOHN A. LEPAK, HENRY E. MICHELSON, RALPH E. MORRIS, CHARLES E. NIXON, THOMAS A. PEPPARD, FREDERICK H. K. SCHAAF, FREDERICK W. WITTICH, CHARLES B. WRIGHT; Research Assistant WILLIAM A. GREY; Assistants EDWARD J. ENGBERG, FRANCES A. FORD, EDWARD C. GAGER, ARTHUR J. HENDERSON, KANO IKEDA, ERNEST S. MARIETTE, JOSEPH C. MICHAELS, FREDERICK P. MOERSCH, CLYDE A. UNDINE, ARCHIBALD W. WARD, SAMUEL A. WEISMAN; Teaching Fellow JOHN C. MCKINLEY.

Departmental Office, Millard Hall

REQUIRED COURSES

- 50w,s. PHYSICAL DIAGNOSIS. A study of general symptomatology and of methods of physical examination, diagnosis, and record; with demonstrations upon the normal and abnormal subject. Introductory to the group teaching of physical diagnosis. Fourth year. 22 hours. ROWNTREE, SCHNEIDER, and Assistants.
- 51su-f, 52f-w. THE PRINCIPLES AND PRACTICE OF MEDICINE. A systematic consideration of the subject, exclusive of neurology and neurologic diagnosis, q.v.; illustrated, so far as possible, by clinical material. The course will include a consideration of the examination for life insurance. Fifth year. 66 hours. ROWNTREE, WHITE, RICHARDS, COOK, GARDNER, RIZER, WITTICH.
- 53f,w,s. PHYSICAL DIAGNOSIS AND CASE TAKING. Studies conducted, with divisions of the class, in the following clinics: (1) cardiac and vascular diseases; (2) respiratory diseases and tuberculosis; (3) metabolic diseases; (4) gastro-intestinal diseases; (5) nervous diseases; (6) dermatology and syphilis. See also Courses 77 and 81. Fifth year. 99 hours. IRVINE, OLSON, SCHNEIDER, SWEITZER, RIZER, WITTICH, WRIGHT, and Assistants.
- 55su,f,s. PHYSICAL DIAGNOSIS. A course of lectures in elaboration of the practical work in the Out-Patient Service. Fifth year. 11 hours. SCHNEIDER, RIZER, WITTICH.

* On leave of absence.

- 56su,f,s. PRACTICAL THERAPY AND THERAPEUTIC TECHNIQUE. A study of special methods of therapeusis. Fifth year. 11 hours. RICHARDS.
- 57f,w,s,su. CLINIC IN MEDICINE. Conducted in the University Hospital. Fifth year; one-half the class for two quarters. 22 hours. RICHARDS, RIZER, LEPAK.
- 59f,w,s,su. SECTION CLINICS IN MEDICINE. Conducted in the Minneapolis City Hospital; a part of the course in required clinics. Fifth year. 11 hours. GARDNER.
- 60w. MOUTH INFECTIONS. The typical infections of the oral cavity and their causal relations to disease. Sixth year. 11 hours. HARTZELL.
- 62w. MEDICAL JURISPRUDENCE. The principles of law, the rules of evidence and the duties of physicians in medico-legal cases. Sixth year. 11 hours. SWEENEY.
- 63f,w,s,su. CLINIC IN MEDICINE. A study of cases and case histories in the University Hospital service. Sixth year. 44 hours. ROWNTREE, WHITE, and Staff.
- 65f,w,s,su. CLINICAL CLERKSHIPS. The personal and direct observation of patients in hospital under the supervision of the staff; the taking and recording of case histories and the making of provisional diagnoses. One fourth of class in each quarter. Fifth and sixth years. 110 hours. The Staff.
- 69f,w,s,su. STUDENT INTERNSHIP. A course of resident study in an assigned hospital, covering the last two quarters of the senior year, under direction of the Faculty members of the hospital staff; section of medicine, 220 hours. The Staff.

ELECTIVE COURSES

101. CLINICAL ELECTIVES; offering the student an assistantship in the Out-Patient Department in any of the services in medicine; nervous and mental diseases; dermatology and syphilis. Open to two students, who have completed clinical clerkships, in each service and in each quarter. The Staff.
103. CLINICS IN MEDICINE; bedside studies at the City and County Hospital, St. Paul. Limited to ten students. HALL.
105. ACUTE INFECTIOUS DISEASES. Non-contagious in character. A comparative study of fevers; conducted at the Minneapolis City Hospital. Limited to six students. ULRICH.
106. DISEASES OF THE RESPIRATORY TRACT. A study of physical signs. Minneapolis City Hospital. Limited to six students. GARDNER.

108. ADVANCED WORK IN GRAPHIC RECORDING AND FUNCTIONAL DIAGNOSIS OF CARDIO-VASCULAR DISEASES. A study of the use of the polygraph and electro-cardiograph. Limited to six students. WHITE, MORRIS.
109. ADVANCED PHYSICAL DIAGNOSIS OF THE CHEST. Practical work on tuberculous patients at available hospitals. Two classes of six students each. WITTICH and Associates.
110. STUDIES IN METABOLISM, CLINICAL, AND EXPERIMENTAL. Limited to six students. ROWNTREE and Staff.
111. PROBLEMS IN ADVANCED MEDICAL DIAGNOSIS. Limited to four students. ULRICH.

DIVISION OF NERVOUS AND MENTAL DISEASES

REQUIRED COURSES

- 69f. NEUROLOGY AND NEUROLOGIC DIAGNOSIS. The general symptomatology and methods of examination of the nervous system; the etiology, pathology, diagnosis, and treatment of the special diseases of the nervous system. Lectures, recitations, and lantern demonstrations. Fifth year. 33 hours. HAMILTON, HAMMES.
- 70su. PSYCHIATRY. The principal data and methods of modern psychiatry, with the diagnosis and treatment of the various mental disorders. Lectures, recitations, and demonstrations. Prerequisite: Course 75. Fifth year. 11 hours. HAMILTON.
- 71f,w,s,su. CLINICAL NEUROLOGY AND PSYCHIATRY. Section clinics in nervous and mental diseases, conducted at the University Hospital and the Minneapolis City Hospital; a part of the course of required clinics. 11 hours. HAMILTON, HAMMES, NIXON.
- 75f,w,s,su. NERVOUS AND MENTAL DISEASES; the personal observation and study of cases in the University Out-Patient Service; a part of the course of required clinics. Sixth year. 8 hours. HAMILTON and Staff.
77. PHYSICAL DIAGNOSIS AND CASE TAKING. Studies conducted with divisions of the class in medical clinics, including neurology; in the Out-Patient Department; a part of Course 53. Fifth year.

ELECTIVE COURSES

113. PATHOLOGY OF THE NERVOUS SYSTEM. The exhibition of gross and microscopic preparations of diseased nerve tissues; the relations existing between pathologic lesions and signs and symptoms; the chief neurone systems and the principles underlying their degeneration. Limited to four students. Prerequisites: Courses 75 and 76. HAMILTON, NIXON.
115. ORGANIC NERVOUS DISEASES. Advanced diagnosis of nervous diseases, with a view of giving each student practical experience in all

the chief diagnostic procedures employed in the study of nervous diseases. Limited to four students. Prerequisites: Courses 75 and 76. HAMILTON.

116. SYPHILITIC NERVOUS AFFECTIONS. The diagnosis and treatment of the expressions of syphilis in the central nervous system, combining clinical and laboratory teaching and referring particularly to dementia paralytica and tabes dorsalis. Limited to six students. HAMMES.
118. REGIONAL DIAGNOSIS. A didactic and clinical conference on the regional diagnosis of lesions of the nervous system. Limited to four students. The Staff.
119. CLINICAL ASSISTANTSHIP, in nervous and mental diseases in the Out-Patient Department. Sixth year. Open to two students. The Staff.

DIVISION OF DERMATOLOGY

- 79f-80w; 79s-80su. COURSE IN DERMATOLOGY. Clinical lectures upon the common skin diseases and syphilis, including diagnosis and treatment. Fifth year. 22 hours. SWEITZER.
- 81f,w,s,su. PHYSICAL DIAGNOSIS AND CASE TAKING. Studies conducted with divisions of the class in medical clinics, including dermatology and syphilis, in the Out-Patient Department; a part of Course 53. Fifth year. 22 hours. IRVINE, OLSON, SWEITZER.
- 83f,w,s,su. CLINIC IN DERMATOLOGY. The practical study of cases of skin and syphilitic disease, in the Out-Patient Service; a part of the course of required clinics. Sixth year. 8 hours. IRVINE, OLSON, SWEITZER.

ELECTIVE COURSES

121. ASSISTANTSHIP IN DERMATOLOGY, in the Out-Patient Department. Open to two students in each quarter. SWEITZER, IRVINE, OLSON.
123. WARD CLINICS IN DERMATOLOGY. Conducted in the City and County Hospital, St. Paul. Limited to ten students. The Staff.

DEPARTMENT OF OBSTETRICS AND GYNECOLOGY

Professor JENNINGS-C. LITZENBERG; Associate Professors FRED L. ADAIR, JOHN L. ROTHROCK; Instructors J. WARREN BELL,* WILLIAM C. CARROLL, WILLIAM H. CONDIT, RAE T. LAVAKE, CLARENCE O. MALAND, C. NAUMAN MCCLOUD, WILLMAR C. RUTHERFORD, ALBERT G. SCHULZE, JALMAR H. SIMONS, IVAR SIVERTSEN; Assistants ELIZABETH M. BARNARD, JAMES F. HAMMOND,* E. MENDELSSOHN JONES, FREDERICK J. SOUBA, THURSTON W. WEUM; Teaching Fellows LEE W. BARRY, LEROY A. CALKINS.

Departmental Office, Institute of Anatomy

REQUIRED COURSES

- 51su,f,s. OBSTETRICS. The physiology of pregnancy, labor, and the puerperium. Fifth year. 33 hours. ADAIR, CONDIT, BARRY, LAVAKE.
- 52f,w. OBSTETRICS. The pathology of pregnancy, labor, and the puerperium. Prerequisite: Course 51. Fifth year. 33 hours. ADAIR, CONDIT, BARRY, LAVAKE.
- 53su,f,s. GYNECOLOGY. A study of diagnostic methods in diseases of women. Fifth year. 11 hours. LITZENBERG, BARRY.
- 54su,f,w,s. PARTURITION CLINICS. Sections of the class on call for parturition clinics at the City Hospital, Minneapolis. Fifth year. ADAIR and Associates.
- 55su,f,w,s. CLINICS IN OBSTETRICS AND GYNECOLOGY. Clinics conducted in the Minneapolis City Hospital; a part of the course of required clinics. Fifth year. ADAIR and Associates.
- 56su,w. GYNECOLOGY. A study of diseases of women. Prerequisite: Course 53. Sixth year. 22 hours. LITZENBERG, ADAIR, BARRY.
- 57su,f,w,s. CLINICAL CLERKSHIP IN OBSTETRICS AND GYNECOLOGY. Direct observation and study of patients in University Hospital and Out-Patient Department under supervision of staff; taking and recording of case histories; making physical examinations and provisional diagnoses; including parturition clinics; operations; and manikin demonstrations. Fifth and sixth years. 33 hours. LITZENBERG and Associates.
- 58su,f,w,s. CLINICS IN OBSTETRICS AND GYNECOLOGY. Demonstrations and personal observations in diagnosis and treatment of cases in the University dispensary; including parturition clinics in the Out-Patient Service; a part of the course of required clinics. 33 hours. CONDIT, MALAND, WEUM, SIVERTSEN, and Teaching Fellows.
- 69f,w,s,su. STUDENT INTERNSHIP. A course of resident study in an assigned hospital, covering the last two quarters of the senior year, under direction of the Faculty members of the hospital staff; section of Obstetrics and Gynecology. 88 hours. The Staff.
- 101su,w. OPERATIVE OBSTETRICS. A study of operative obstetrics. Prerequisites: Courses 51 and 52. Sixth year. 11 hours. LITZENBERG, ADAIR.
- 102w, 103s. OBSTETRICS AND GYNECOLOGY. A study of the pathology of pregnancy, labor, and the puerperium, and of diseases of women. A

course of lectures, demonstrations, case analyses and class clinics. Sixth year. Prerequisites: Courses 55 and 56. 44 hours. LITZENBERG, BARRY.

ELECTIVE COURSES

103. OBSTETRIC AND GYNECOLOGIC CLINIC. A study of diagnosis and treatment of obstetric conditions and diseases of women at the University Hospital. Limited to six students. Hours and credits arranged. LITZENBERG, BARRY.
104. OBSTETRIC DIAGNOSIS. A study of ante-partum conditions in selected cases in the University Dispensary. ADAIR, CONDIT, LAVAKE, BARRY.
105. GYNECOLOGIC CLINIC. A study in diagnosis and treatment of diseases of women. St. Paul dispensary. Two students. ROTHROCK.
- 106, 107. GYNECOLOGIC CLINIC. Diagnostic and operative clinic in diseases of women. City and County Hospital, St. Paul. ROTHROCK, JONES.
108. OBSTETRIC CLINIC. A study of the diagnosis and treatment of obstetric conditions. City and County Hospital, St. Paul. SCHULZE.
109. GYNECOLOGIC CLINIC. Bedside studies in diagnosis and treatment of diseases of women. City and County Hospital, St. Paul. JONES.
110. CLINICS IN OBSTETRICS AND GYNECOLOGY. A clinic in diagnosis and treatment of obstetric conditions and diseases of women. Minneapolis City Hospital. SIMONS.
111. CLINIC IN OBSTETRICS AND GYNECOLOGY. Same as above. MALAND.
112. APPLIED ANATOMY OF THE PELVIS. A study of the anatomy of the female generative organs using anatomical specimens, models, and the patient for demonstrations. LAVAKE.
113. OPERATIVE OBSTETRICS. Manikins demonstrations of obstetric operations and special procedures. Prerequisite: Obstetric clinical clerkship. Sixth year. Limited to six students. BARRY.
114. ADVANCED PATHOLOGY OF THE FEMALE PELVIS. Gross and microscopic study of the pathological conditions of the female generative organs. Prerequisite: General and special pathology and histology. ADAIR, BARRY.
201. ADVANCED OBSTETRICS AND GYNECOLOGY. Includes service in the University Hospital, affording ample opportunity for experience in diagnosis; care and treatment, operative and non-operative, of patients. Special facilities offered for study of problems and cases of unusual interest. Required of first-year Fellows. Hours arranged. LITZENBERG and Staff.

202. Similar to Course 201, but in more advanced subjects in their clinical and research aspects. Adapted to the increased training and experience of the student. Required of second-year Fellows. Hours arranged. LITZENBERG and Staff.
203. Similar to Courses 201 and 202; but of more advanced character. Required of third-year Fellows. Hours arranged. LITZENBERG and Staff.
204. SEMINAR. A weekly conference of the staff, including Fellows and graduate students. Presentation and discussion of original work and reports upon current literature in obstetrics and gynecology. A reading knowledge of French and German is necessary. LITZENBERG and Staff.
205. RESEARCH. Clinical and laboratory researches upon problems in obstetrics and gynecology. Required of third-year Fellows, who must complete a satisfactory thesis during the year. Elective for second-year Fellows, or other properly qualified graduate students. Hours arranged. LITZENBERG and Staff.

THE DEPARTMENT OF PEDIATRICS

Professor JULIUS PARKER SEDGWICK; Associate Professors JAMES T. CHRISTISON, WALTER R. RAMSEY;* Assistant Professors EDGAR J. HUENEKENS, FREDERICK C. RODDA, FREDERICK W. SCHLUTZ,* ROOD TAYLOR; Instructors BRONSON CROTHERS,* NABOTH O. PEARCE, MAX SEHAM, MILDRED R. ZIEGLER; Assistants EDWARD D. ANDERSON, EDWIN J. BATCHELDER, WILLIAM D. BEADIE, WYMAN C. COLE, GEORGE K. HAGAMAN, GRIFFITH M. JONES, GLENN R. MATCHAN, CECILE MORIARITY, CHARLES A. OLSON, EUGENE F. WARNER; Teaching Fellow LUDO VON MEISENBURG.

Departmental Office, Millard Hall

REQUIRED COURSES

- 100f,w,s,su. PHYSICAL DIAGNOSIS IN CHILDREN. A study of special diagnostic methods and results, applied to pediatrics. Conducted in sections of class. Fifth year. 11 hours; 1 credit. TAYLOR.
- 101su,w. DISEASES OF CHILDREN. The etiology, pathology, diagnosis, and treatment of diseases peculiar to, or distinctive of, children, with particular emphasis upon their differences from adult type. Fifth year. 33 hours. SEDGWICK, CHRISTISON.
- 102f,s. DISEASES OF CHILDREN. A continuation of Course 101. Fifth year. 22 hours. SEDGWICK, CHRISTISON.

* On leave of absence.

- 103f,w,s,su. CLINIC IN PEDIATRICS. Conducted at the University Hospitals and Minneapolis City Hospitals; a part of course in required clinics. Sections of class. Fifth year. 11 hours. SEDGWICK, HUENEKENS, RODDA, and Assistants.
- 104f,w,s,su. CLINIC IN CONTAGIOUS DISEASES. Conducted in the Minneapolis City Hospital; a part of course in required clinics. Sections of class. Fifth year. 11 hours. HUENEKENS and Assistants.
- 105f,w,s,su. CLINIC IN PEDIATRICS. An advanced clinical course, conducted at the University Hospitals and Minneapolis City Hospitals. Sections of class. Sixth year. 11 hours. SEDGWICK, HUENEKENS, RODDA.
- 106f,w,s,su. OUT-PATIENT PEDIATRIC CLINIC. The practical study of the diseases of children in the Out-Patient Service. Sections of class. Sixth year. 33 hours. SEHAM and Assistants.
- 107f,w,s,su. CLINICAL CLERKSHIP IN PEDIATRICS. The observation and study of patients in University Hospital and Out-Patient Department under supervision of staff; recording case histories; making physical examinations and provisional diagnoses; following details of treatment. Fifth and sixth years. 33 hours. Staff.
- 108f,w,s,su. STUDENT INTERNSHIP; a course of resident study in an assigned hospital, covering two quarters, sixth year, under direct supervision of Faculty members of hospital staff; section in pediatrics. 88 hours. The Staff.

ELECTIVE COURSES

111. DISEASES OF THE NEW-BORN. The pathology and treatment of these disorders, with the presentation of illustrative cases. Limited to six students. SEDGWICK, RODDA.
112. CONTAGIOUS DISEASES. The advanced study of contagious diseases, including the practice of intubation and tracheotomy, with training upon the cadaver. HUENEKENS.
113. PEDIATRIC CLINIC. Out-Patient Department. Limited to six students. SEHAM.
114. COURSE IN INFANT FEEDING. Conducted at the St. Paul Baby Welfare Clinic of the H. Amherst Wilder Charity. RAMSEY.
115. THEORY AND PRACTICE OF INFANT FEEDING. Including a study of diseases of the gastro-intestinal tract. Limited to six students. HUENEKENS.
- 117, 117x, 117z. CLINICS IN PEDIATRICS; conducted in the Out-Patient Service. SEHAM.
119. CLINICS IN PEDIATRICS; conducted at the University Hospital. RODDA.

121. CLINIC IN CONTAGIOUS DISEASES; conducted at the City and County Hospital, St. Paul. Limited to ten students. RAMSEY, WARNER, OLSON.

DEPARTMENT OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

Associate Professor WILLIAM R. MURRAY;* Assistant Professors FRANK E. BURCH,† HOWARD S. CLARK, JOHN S. MACNIE,† HORACE NEWHART, FRED J. PRATT; Instructors WALTER E. CAMP, WILLIAM W. LEWIS, WILLIAM E. PATTERSON, JOHN A. PRATT, G. ELMER STROUT; Assistants OSCAR A. BURTON, CARL C. COWIN, ARTHUR L. KUSKE, EARL A. LOOMIS, KENNETH A. PHELPS, ARTHUR E. SMITH, H. JOURNEY WELLES; Teaching Fellow JAMES L. ROGERS.

Departmental Office, Millard Hall

REQUIRED COURSES

- 77su,s. OPHTHALMOLOGY. A course of lectures upon the diseases and disorders of the eye, and their corrective, medical, and surgical treatment. Sixth year. 22 hours. MURRAY.
- 79w. OTOTOLOGY. A course of lectures upon the diseases and disorders of the ear; their corrective, medical, and surgical treatment. Sixth year. 11 hours. NEWHART.
- 81f,s. RHINOLOGY AND LARYNGOLOGY. The diagnosis and treatment of diseases of the nose and throat. Sixth year. 17 hours. MURRAY.
83. CLINICS IN EYE, EAR, NOSE, AND THROAT. Diagnostic and operative procedures in the clinics of the University Hospital. Sixth year. 15 hours. CLARK.
- 85f,w,s,su. CLINIC IN DISEASES OF THE EYE. Study and treatment of cases in the Out-Patient Service; class in sections; a part of course in required clinics. Sixth year. 17 hours. MACNIE, CLARK, and Assistants.
- 87f,w,s,su. CLINIC IN DISEASES OF THE EAR. Study and treatment of cases in the Out-Patient Service; class in sections; a part of course in required clinics. Sixth year. 7 hours. NEWHART and Assistants.
- 89f,w,s,su. CLINICS IN DISEASES OF THE NOSE AND THROAT. Study and treatment of cases in the Out-Patient Service at three weekly sessions; class in sections; a part of course in required clinics. Sixth year. 17 hours. PRATT, PATTERSON, and Assistants.

* Acting Chief of the Department.

† On leave of absence.

- 91f,w,s,su. STUDENT INTERNSHIP. A resident course in an assigned hospital, covering two quarters, sixth year, under direct supervision of Faculty members of the hospital staff; section in Ophthalmology and Oto-Laryngology. 22 hours.

ELECTIVE COURSES

115. CLINIC IN DISEASES OF THE EYE. The examination of patients, diagnosis of disease conditions and supervised treatment. Clinic conducted in the Out-Patient Department. MACNIE, CLARK, and Assistants.
117. CLINIC IN DISEASES OF THE EAR. Studies in examination of cases, diagnosis, and supervised treatment; conducted in the Out-Patient Department. NEWHART and Assistants.
119. CLINIC IN DISEASES OF THE NOSE AND THROAT. The examination of patients, diagnosis of disease conditions and supervised treatment. Clinic at the Out-Patient Department. PRATT, PATTERSON, and Assistants.
121. OPERATIVE CLINICS IN EYE, EAR, NOSE, AND THROAT. Conducted at the University Hospital. Limited to ten students. MURRAY, BURCH, CLARK.
123. REFRACTION. A course of lectures. Required of all desiring the practical Course 125. BURCH.
125. PRACTICAL COURSE IN REFRACTION. Limited to ten students. Prerequisite: Course 123. BURCH, LOOMIS.
126. OPHTHALMOSCOPY. The principles and practice of this method of examination of the eye. MACNIE, CLARK.
127. CLINIC IN DISEASES OF THE EYE. City and County Hospital, St. Paul. Limited to ten students. LEWIS.
201. SEMINAR IN OPHTHALMOLOGY AND OTO-LARYNGOLOGY. Sixth year. The Staff.

THE DEPARTMENT OF SOCIAL SERVICE

Director, MARION A. TEBBETS

ELECTIVE COURSES

101. MEDICAL SOCIAL SERVICE. A study of interrelated physical, social, and industrial conditions affecting the patient's health. The origin and purpose of medical social service. The social factors in household, industrial, and communal health. Lectures and field work. Limited to ten students. TEBBETS.

THE SCHOOL OF CHEMISTRY

Associate Professor WILLIAM H. HUNTER; Assistant Professor FRANK H. MACDOUGALL; Instructors CARL L. SCHUMAN, LAWRENCE M. HENDERSON.

(Contributing courses to The Medical School)

- 40f. PHYSICAL CHEMISTRY. Special attention will be given to those divisions of the subject which have most application in the science of medicine, such as osmosis, colloidal solutions, chemical equilibria, etc. Third-year medical students. 99 hours; four credits. HENDERSON.

DEPARTMENT OF ANIMAL BIOLOGY

Professors HENRY F. NACHTRIEB, HAL DOWNEY, CHARLES P. SIGERFOOS, ELMER LUND, WILLIAM A. RILEY.

(Contributing elective courses to the Medical School)

- 45w,su. RELATION OF INSECTS TO DISEASE. The causation and transmission of diseases by insects and other arthropods. Life history, habits, and methods of control of hominoxious species. RILEY.
- 107s. PROTOZOOLOGY. Lectures, reference, and laboratory work on the structure and life histories of Protozoa. Special reference is paid to the relations of the Protozoa to diseases of animals. SIGERFOOS.
- 149f-150w-151s. BLOOD OF VERTEBRATES. A comparative study of blood and blood-forming organs of vertebrates. A portion of time to be devoted to research. DOWNEY.
- 153f-154w-155s. HEMATOLOGY. Primarily for medical students, but open to others with proper qualifications. Lectures and laboratory work on the blood and blood-forming organs of man and mammals. DOWNEY.

NOTE: For information regarding other available courses in Chemistry, see Bulletin, School of Chemistry.

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The Bulletin of the University of Minnesota

*The Medical School
Announcement for the Year
1920-1921*

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CALENDAR

1920-1921

1920

September	18	Saturday	Payment of fees closes, except for new students
September	21-28	Week	Examinations for removal of conditions, and entrance examinations Registration period, Colleges of Science, Literature, and the Arts, and Agriculture, Forestry, and Home Economics
September	27-28		Registration days for all colleges not indicated above
September	28	Tuesday	Payment of fees for new students closes
September	29	Wednesday	Fall quarter begins, 8:00 a.m.
October	21	Thursday	Senate meeting, 4:30 p.m.
November	2	Tuesday	Election Day; a holiday
November	25	Thursday	Thanksgiving Day; a holiday
December	16	Thursday	Senate meeting, 4:30 p.m.
December	22	Wednesday	Fall quarter ends, 5:20 p.m.
December	22	Wednesday	Christmas vacation begins, 5:20 p.m.

1921

January	4	Tuesday	Christmas vacation ends, 8:00 a.m.
January	4	Tuesday	Winter quarter begins, 8:00 a.m.
January	4	Tuesday	School of Embalming begins
February	12	Saturday	Lincoln's Birthday; a holiday
February	17	Thursday	Senate meeting, 4:30 p.m.
February	22	Tuesday	Washington's Birthday; a holiday
March	24	Thursday	Winter quarter ends, 5:20 p.m.
March	24	Thursday	Spring vacation begins, 5:20 p.m.
March	30	Wednesday	Spring vacation ends, 8:00 a.m.
March	30	Wednesday	Spring quarter begins, 8:00 a.m.
May	19	Thursday	Senate meeting, 4:30 p.m.
May	30	Monday	Memorial Day; a holiday
June	12	Sunday	Baccalaureate service
June	14	Tuesday	Spring quarter closes, 5:20 p.m.
June	15	Wednesday	Forty-ninth annual commencement
June	17-18		Registration days for summer session
June	20	Monday	Summer session begins
July	30	Saturday	First term, summer session closes
September	3	Saturday	Second term, summer session closes

THE MEDICAL SCHOOL

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¹ Resigned July 1, 1920.

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FREDERICK W. WITTICH, M.A., M.D., Assistant Professor of Medicine
FRANKLIN R. WRIGHT, D.D.S., M.D., F.A.C.S., Associate Professor of Urology, in charge of the Division of Urology
FREDERICK J. WULLING, Phm.D., LL.M., Professor of Pharmacy
HARRY B. ZIMMERMAN, M.D., Assistant Professor of Surgery
- JOHN S. ABBOTT, B.A., M.D., Instructor in Surgery
J. WARREN BELL, M.D., Instructor in Obstetrics and Gynecology
ANNE BENTON, M.A., Instructor in Bacteriology
WALTER E. CAMP, M.A., M.D., Instructor in Ophthalmology and Otolaryngology
WALLACE COLE, M.D., Instructor in Orthopedic Surgery
LLOYD B. DICKEY, B.S., M.A., Instructor in Anatomy
CHARLES R. DRAKE, M.D., Instructor in Medicine
WALTER A. FANSLER, M.A., M.D., Instructor in Surgery
CHARLES C. GAULT, M.A., Instructor in Physiology
PAUL W. GIESSLER, B.S., M.D., Instructor in Orthopedic Surgery
ESTHER M. GREISHEIMER, B.S. in E., Ph.D., Instructor in Physiology
JAMES F. HAMMOND, M.D., C.M., Instructor in Obstetrics and Gynecology

- OLGA S. HANSEN, B.S., M.D., Instructor in Medicine
 HUGO J. HARTIG, B.S., M.D., Instructor in Surgery
 MARGARET M. HOSKINS, Ph.D., Instructor in Anatomy
 E. MENDELSSOHN JONES, M.D., Instructor in Obstetrics and Gynecology
 HENRY N. KLEIN, M.D., Instructor in Dermatology and Syphilis
 WALTER J. KREMER, M.D., Instructor in Urology
 RAE T. LAVAKE, B.A., M.D., Instructor in Obstetrics and Gynecology
 JOHN A. LEPAK, B.S., M.D., Instructor in Medicine
 WILLIAM W. LEWIS, M.D., Instructor in Ophthalmology and Oto-Laryngology
 CHAUNCEY A. MCKINLAY, B.A., M.D., Instructor in Medicine
 CLARENCE O. MALAND, B.S., M.D., Instructor in Obstetrics and Gynecology
 ERNEST S. MARIETTE, B.S., M.D., Assistant in Medicine
 HENRY E. MICHELSON, M.D., Instructor in Dermatology and Syphilis
 CHARLES E. NIXON, M.S., M.D., Instructor in Nervous and Mental Diseases
 GUSTAVE J. NOBACK, B.S., Instructor in Anatomy
 HARRY OERTING, M.D., Instructor in Medicine
 FREDERICK A. OLSON, M.S., M.D., Instructor in Surgery
 WILLIAM E. PATTERSON, M.D., Instructor in Ophthalmology and Oto-Laryngology
 NABOTH O. PEARCE, M.D., Instructor in Pediatrics
 THOMAS A. PEPPARD, M.D., Instructor in Medicine
 KENNETH L. PHELPS, M.D., Instructor in Ophthalmology and Oto-Laryngology
 ELIZABETH PIERCE, R.N., Instructor in Nursing
 JOHN A. PRATT, M.D., Instructor in Ophthalmology and Oto-Laryngology
 EMIL C. ROBITSHEK, M.D., Instructor in Surgery
 FREDERICK H. K. SCHAAF, M.D., Instructor in Medicine
 ALBERT G. SCHULZE, M.D., Instructor in Obstetrics
 MAX SEHAM, M.D., Instructor in Pediatrics
 IVAR SIVERTSEN, B.S., C.M., M.D., Instructor in Obstetrics and Gynecology
 FREDERICK J. SOUBA, B.S., M.D., Instructor in Obstetrics and Gynecology
 G. ELMER STROUT, M.D., Instructor in Ophthalmology and Oto-Laryngology
 THEODORE H. SWEETSER, B.S., M.D., Instructor in Pathology
 MARION A. TEBBETS, B.A., Director of Department of Social Service
 GERTRUDE I. THOMAS, Instructor in Dietetics
 MARION L. VANNIER, R.N., Assistant Superintendent of School of Nursing and Instructor
 PERCY A. WARD, B.S., M.D., Instructor in Experimental Therapeutics
 ROSCOE C. WEBB, B.A., M.D., Instructor in Surgery
 ANTON G. WETHALL, B.S., M.D., Instructor in Urology
 THURSTON W. WEUM, B.S., M.D., Instructor in Obstetrics and Gynecology
 CHARLES B. WRIGHT, B.A., M.D., Instructor in Medicine
 HERBERT M. N. WYNNE, B.S., M.D., Instructor in Obstetrics and Gynecology
 MILDRED R. ZIEGLER, B.A., M.S., Instructor in Pediatrics

TEACHING ASSISTANTS

- EDWARD D. ANDERSON, B.A., M.D., Assistant in Pediatrics
 EDWIN J. BATCHELDER, M.D., Assistant in Pediatrics
 ERIE T. W. BOQUIST, B.S., M.D., Assistant in Medicine
 OSCAR A. BURTON, M.D., Assistant in Ophthalmology and Oto-Laryngology
 JOHN C. BROWN, B.S., M.D., Assistant in Ophthalmology and Oto-Laryngology
 CARL C. COWIN, M.D., Assistant in Ophthalmology and Oto-Laryngology
 EDWARD C. GAGER, M.D., Assistant in Dermatology
 JOHN D. GEISSINGER, M.D., Assistant in Pediatrics
 ROBERT C. GREEN, Assistant in Bacteriology
 WILLIAM A. GREY, D.D.S., Research Assistant in Mouth Infections
 OTTO A. GROEBNER, B.S., M.D., Assistant in Pediatrics
 GEORGE K. HAGAMAN, M.D., Assistant in Pediatrics
 ERLING W. HANSON, B.S., M.D., Assistant in Ophthalmology and Oto-Laryngology
 WILLIAM H. HENGSTLER, M.D., Assistant in Nervous and Mental Diseases
 CLARENCE HERMANN, D.D.S., Assistant in Dental Diseases
 LILIANO IKEDA, M.D., Assistant in Medicine
 M. KELLER KNAUFF, M.D., Assistant in Orthopedic Surgery
 JOHN C. KOCH, M.D., Assistant in Medicine
 ARTHUR L. KUSSKE, M.D., Assistant in Ophthalmology and Oto-Laryngology
 EARL A. LOOMIS, B.A., M.D., Assistant in Ophthalmology and Oto-Laryngology
 GLENN R. MATCHAN, M.D., Assistant in Pediatrics
 JOSEPH C. MICHAELS, B.S., M.D., Assistant in Nervous and Mental Diseases
 CECILE R. MORIARTY, B.S., M.D., Assistant in Pediatrics
 ALLEN T. NEWMAN, B.Sc., M.Sc., Assistant in Pharmacology
 HENRY ODLAND, B.S., M.D., Assistant in Dermatology and Syphilis
 CHARLES A. OLSON, M.D., Assistant in Pediatrics
 EDWIN F. ROBB, B.A., M.D., Assistant in Pediatrics
 JOHN L. SHELLMAN, M.D., Assistant in Ophthalmology and Oto-Laryngology
 ARTHUR E. SMITH, M.D., Assistant in Ophthalmology and Oto-Laryngology
 JOSEPH J. STRATTE, B.A., M.D., Assistant in Surgery
 CLYDE A. UNDINE, M.D., Assistant in Medicine
 ARCHIBALD W. WARD, M.D., Assistant in Medicine
 EUGENE F. WARNER, M.D., Assistant in Pediatrics
 H. JOURNEY WELLES, M.D., Assistant in Ophthalmology and Oto-Laryngology
 SAMUEL A. WEISMAN, B.S., M.B., M.D., Assistant in Medicine
 FRANK W. WHITMORE, M.D., Assistant in Medicine
 CLARENCE E. WILLCUTT, M.D., Assistant in Obstetrics and Gynecology

DANIEL E. ZISKIN, D.D.S., Assistant in Dental Diseases

THOMAS ZISKIN, M.D., Assistant in Medicine

TEACHING FELLOWS

ELLERY L. ARMSTRONG, B.S., M.D., in the Department of Ophthalmology and Oto-Laryngology

LEROY A. CALKINS, B.S., M.B., M.D., in the Department of Obstetrics and Gynecology

ANGUS L. CAMERON, B.A., M.S., M.D., in the Department of Surgery

CASSIUS M. COLDREN, B.A., M.D., in the Department of Obstetrics and Gynecology

HALBERT L. DUNN, B.A., in the Department of Anatomy

SOLOMON FINEMAN, B.S., M.D., in the Department of Medicine

CHARLES J. HUTCHINSON, B.A., M.D., Health Service Fellow in Medicine

FRANK N. KNAPP, M.D., in the Department of Ophthalmology and Oto-Laryngology

JOHN C. MCKINLEY, B.S., M.D., in the Department of Medicine

HELEN A. MACKEN, B.S., M.A., in the Department of Anatomy

JOHN P. QUIGLEY, B.S., M.D., in the Department of Pharmacology

JAMES L. ROGERS, M.D., in the Department of Ophthalmology and Oto-Laryngology

W. RAY SHANNON, B.S., M.D., in the Department of Pediatrics

DAVID M. SIPERSTEIN, B.S., in the Department of Anatomy

SAMUEL B. SOLHAUG, B.S., M.D., Health Service Fellow in Obstetrics

CHESTER A. STEWART, Ph.D., M.D., in the Department of Pediatrics

CHESTER O. TANNER, B.S., M.D., Health Service Fellow in Surgery

LUDO VON MEYSENBURG, B.A., M.D., in the Department of Pediatrics

ARTHUR A. ZIEROLD, B.S., D.D.S., M.D., in the Department of Surgery

GENERAL INFORMATION

ADMISSION

The Medical School is conducted on the four-quarter system. Beginning students are received at the opening of the fall quarter; and in a few instances at the beginning of the winter quarter. Students with advanced standing may be received at the beginning of any quarter for work for which they are prepared.

SUMMARY OF REQUIREMENTS FOR ADMISSION

Ninety quarter credits of college work, with 90 honor points, and including rhetoric, 9 credits; chemistry, 18 credits; physics, 12 credits, and zoology, 12 credits; a reading knowledge of French or German.

DETAILED STATEMENT OF REQUIREMENTS FOR ADMISSION

The two years of college work are defined as including not less than 90 quarter credits (60 semester credits) carrying not less than 90 quarter honor points (60 semester honor points). To understand this requirement it should be noted that on the basis of A, B, C, and D as passing grades, D gives no honor points; C, one honor point for each credit; B, two honor points for each credit; A, three honor points for each credit. It is impossible for a student with only the minimum passing grades to secure admission. Students with a high ratio of honor points to total credits are given preference in the selection of candidates for admission.

The pre-medical credits must include the following:

1. *Rhetoric*: 9 quarter (6 semester) credits. At Minnesota this requirement is met by Rhetoric 4-5-6 (9 credits) or by English-Rhetoric A-B-C (15 credits).

2. *Chemistry*: 18 quarter (12 semester) credits, including general chemistry, qualitative and quantitative analysis,* and organic chemistry with laboratory work. At Minnesota, Courses 4-5 (or 1, 2, 3), 11, 20, and 31-32 are necessary. Students are advised also to take chemistry in high school.

3. *Physics*: 12 quarter (8 semester) credits, including proper laboratory work. At Minnesota, Courses 21, 22, and any two of the following combinations, 41 and 42, 51 and 52, 61 and 62, meet the requirement. Students are advised to complete them all. (See bulletin of the College of Science, Literature, and the Arts for description of these courses and statement of prerequisites.)

4. *Zoology*: 12 quarter (8 semester) credits, including proper laboratory work. At Minnesota, Animal Biology Courses 5, 6, 7, meet this requirement.

5. *Foreign language*: Sufficient high-school or college training to insure a reading knowledge of French or German medical literature. This requirement is fulfilled as regards French:

* Quantitative chemistry required in 1922-23; advised for 1920-21 and 1921-22.

(a) By passing any two of Courses 21, 22, 23 in Scientific French in the Department of Romance Languages of this University or by acceptable courses covering similar work done elsewhere;

or (b) By passing an examination conducted by the Department of Romance Languages. The minimum preparation demanded for admission to this examination is 15 credits of French.

The language requirement is fulfilled as regards German:

(a) By passing in Courses 31-32, Department of German, in this University or by acceptable credits covering similar work done elsewhere;

or (b) By passing an examination in scientific German conducted by the Department of German. The usual requirement for admission to this examination is two college years of German or satisfactory equivalent.

6. *Advised subjects:* Pre-medical students are advised to secure preparation in some or all of the following: Latin (high-school or college), higher mathematics, psychology, sociology, drawing, and comparative anatomy.

REGISTRATION

On account of the limited capacity of the school the incoming (third-year or freshman) class will be limited to ninety. Application blanks may be obtained from the dean's office, and should be filled out and returned as soon as a candidate's entrance requirements are completed. If pre-medical college work was done elsewhere than at the University of Minnesota, certified credentials showing subjects, credits, and grades must be presented.

Accepted applicants will be notified and will receive a bill for a preliminary fee of \$10. This must be paid within ten days, in order to hold a place in the limited registration. The above fee will be applied on the first quarter's tuition, and will not be returnable should the student fail to enter.

Candidates will be selected on the basis of their previous work. About sixty will be accepted early in July. The remaining thirty will be accepted about August 15, giving students the opportunity to use the summer school to complete requirements.

Other qualifications being equal, residents of Minnesota will be given preference in selecting students for the Medical School.

ADMISSION WITH ADVANCED STANDING

Honorably dismissed students of Class A medical schools may be received into advanced classes. Such students must make formal application on the blank provided and must submit credentials covering pre-medical and medical studies. Such credentials must show that the student has maintained the standards of scholarship required of students in this school.

As a rule notebooks and other evidences of laboratory work must be presented. The amount of advanced standing to be granted a student from another school is decided by the respective departments in conference with the Students' Work Committee. Subject credit, but not time credit, may be given for studies pursued other than in medical schools.

The fifth and sixth (junior and senior) years are limited to eighty students in each class, in divisions of forty students. Division A begins

the work of the fifth year in the summer quarter; Division B in the fall quarter. Students desiring to enter the junior year from other schools should bear these facts in mind in making application for admission.

COMBINED COURSES IN ARTS OR SCIENCE AND MEDICINE

Students who are candidates for the degree of Bachelor of Arts, who have successfully completed three years, or 135 credits and honor points, under the rules of the College of Science, Literature, and the Arts, may elect their fourth year in the Medical School and secure the remaining 45 credits and 45 honor points, required for the Bachelor of Arts degree in this school.

Similarly, students who have completed, with the required number of honor points, the work of the first two years, or 90 quarter credits (60 semester credits), in the College of Science, Literature, and the Arts, or other approved college, may enter the Medical School, and upon the successful conclusion of the first two years of medical study, earning the required 90 quarter credits and the like number of honor points, will receive the degree of Bachelor of Science.

It will be understood that in either of these combined courses the required subjects must be included, viz.: rhetoric, chemistry, zoology, physics, and a reading knowledge of French or German. All special requirements of the College of Science, Literature, and the Arts must likewise be fulfilled; see bulletins of that college.

THE CURRICULUM

DEPARTMENTAL HOURS

	Clock hours		Clock hours
Physical chemistry.....	99	Surgery including roentgenology.	526*
Anatomy, gross and microscopic..	704	Obstetrics	314*
Physiology, including physiologic Chemistry	451	Pediatrics	337*
Bacteriology	176	Ophthalmology and oto- laryngology	138*
Pathology, including hygiene....	363	Electives†	264
Pharmacology	165		
Medicine	896*	Total	4,433

ARRANGEMENT OF COURSES

Department and Course	Third (Freshman) Year			Fourth (Sophomore) Year		
	1st qtr.	2nd qtr.	3rd qtr.	4th qtr.	5th qtr.	6th qtr.
Anat. 5, 6, 7 (Dissection).....	12	12	6	..	..	..
Anat. 103 (Histology).....	..	..	15	..	..	..
Anat. 107 (Embryology).....	..	..	9	..	..	..
Chem. 40 (Physical Chem.)...	9	..	..	..	..	..
Physiol. 100-101 (Physiol.Chem.)	9	9	..	..	..	..
Bact. 1 (Gen. Bact.).....	..	9	..	..	..	..
Anat. 111 (Neurology).....	..	..	..	10	..	..
Physiol. 103-4 (Physiology)...	..	..	..	15	8	..
Bact. 101 (Spec. Bact.).....	..	..	..	7	..	..
Path. 101-2 (Pathology).....	..	..	..	..	15	15
Pharm. 102-4 (Gen. & Exp. Pharm.)	..	..	..	..	..	9
Path. 103 (Hygiene).....	..	..	..	..	3	..
Med. 50 (Phys. Diag.).....	..	..	..	..	..	6
Electives	..	..	..	..	6	6
Total clock hours per week	30	30	30	32	32	36

* Including proportional time for student internship.

† Students may take other elective work in place of student internship, thus raising their total elective hours to 924 and changing to some extent the distribution among the departments.

Department and Course	Division A						Division B					
	Fifth Year			Sixth Year			Fifth Year			Sixth Year		
	Su.	F.	W.	S.	Su.	F.	F.	W.	Su.	F.	W.	S.
Pharm. 105-6 (Pharm. & Ther.)	2	2	..	..	..	..	2	2	..	..	..	..
Pharm. 107 (Ther. Conf.)	..	..	..	..	I	..	..	..	..	..	I	..
Pharm. 108 (Presc. Writing)	I	..	..	..	..	..	I	..	..	..	..	..
Path. 103 (Hygiene)	..	3	..	..	..	..	3	..	..	..	..	..
Med. 51-2 (Gen'l Med.)	3	3	..	..	..	..	3	3	..	..	..	..
Med. 53 (Phys. Diagnosis)	4	2	..	..	..	..	2	4	..	..	..	..
Med. 54 (Clin. Ch. & Mic.)	6	..	..	..	..	..	6	..	..	..	..	..
Med. 55 (Phys. Diag. Lects.)	I	..	..	..	..	..	I	..	..	..	..	..
Med. 56 (Prac. Therapy)	..	..	I	..	..	..	..	..	I	..	..	..
Med. 57 (Med. Clinic)	I	I	..	..	..	..	I	I	..	..	..	..
Med. 58 (Med. Clinic)	..	..	I	I	..	..	..	..	I	I	..	..
Med. 60, 62 (Jur. & Mth. Infec.)	..	..	..	..	..	2	..	..	..	2	..	..
Med. 63 (Med. Clinic)	..	..	..	..	I	I	..	..	..	..	I	I
Med. 69 (Nerv. Dis.)	..	3	..	..	..	..	..	3	..	..	..	..
Med. 70 Psychiatry	..	..	..	..	I	..	..	..	..	..	I	..
Med. 79, 80 (Dermatology)	I	I	..	..	..	..	I	I	..	..	..	..
Surg. 51 (Prin. Surg.)	2	2	..	..	..	..	2	2	..	..	..	..
Surg. 53 (Gen'l Surg.)	..	3	..	..	..	..	..	3	..	..	..	..
Surg. 55-56 (Regional)	..	..	2	2	..	..	..	2	2	..	..	..
Surg. 58 (Fractures)	..	..	..	2	..	..	..	..	..	..	..	2
Surg. 59 (Diag. Clinic)	I	I	..	..	..	..	I	I	..	..	..	..
Surg. 72 (Orthopedia)	..	..	..	..	..	I	..	..	..	..	..	I
Surg. 73 (Genito-Urinary)	..	..	..	I $\frac{1}{2}$	..	..	..	..	..	I $\frac{1}{2}$	..	..
Surg. 79 (Roentgenology)	..	..	..	..	I	..	..	..	..	..	I	..
Obst. 51-2 (Obstetrics)	3	3	..	..	..	..	3	3	..	..	..	..
Obst. 53 (Oper. Obst.)	..	..	..	I	..	..	..	..	..	I	..	..
Obst. 54 (Gyn. Diag.)	I	..	..	..	..	..	I	..	..	..	..	..
Obst. 55 (Gynecology)	..	..	2	..	..	..	..	2	..	..	..	..
Obst. 56, 57 (Obst. & Gyn.)	..	..	..	..	2	2	..	..	..	..	2	2
Ped. 100 (Diag. Clinic)	I	..	..	..	..	..	I	..	..	..	..	..
Ped. 101, 102 (Pediatrics)	..	3	2	..	..	..	..	..	3	2	..	..
Oph. & Otol. 77 (Ophthal.)	..	..	2	..	..	..	..	..	2	..	..	..
Oph. & Otol. 79 (Otology)	..	..	..	I	..	..	..	..	..	I	..	..
Oph. & Otol. 81 (Rhin. & Lar.)	..	..	..	I $\frac{1}{2}$	..	..	..	..	..	I $\frac{1}{2}$	..	..
Section Exercises	3	3	..	..	..	..	3	3	..	..	..	..
Clerkship, Sect. Clin., etc.	..	..	28	28	..	..	..	..	28	28	..	..
Elective†	6	6	..	..	30	30	6	6	..	..	30	30
Total clock hours per week..	36	36	38	38	36	36	37	36	39	38	36	36

Figures represent actual hours each week.

† The elective work in the final six months may be a student internship in one of the hospitals under University control or affiliation. A value of 30 hours a week is arbitrarily assigned to the student internships and is divided among the departments as follows: Medicine, 12 hours; Surgery, 10 hours; Obstetrics, 4 hours; Pediatrics, 3 hours; Ophthalmology and Oto-Laryngology, 1 hour.

MARKING SYSTEM

Four passing grades, indicated by the symbols A, B, C, and D, represent differing degrees of merit. While a grade of D passes a student in an individual course, not less than an average of C is regarded as satisfactory work. To effect this the honor point system is used. D gives no honor points; C gives one honor point for each credit hour; B, two honor points per credit hour; A, three honor points per credit hour. (See rules below founded on this system.)

E represents a condition, which may be removed by examination and by such supplementary work as the department imposing it may require. F stands for a failure and calls for a repetition of the work in class. I stands for incomplete and grants the student one month's time for the completion of the required work.

SCHOLARSHIP RULES

1. Any student who, at the end of any given quarter, receives grade E or F in more than fifty per cent of his registered work in that quarter, will be indefinitely dropped for poor scholarship; such percentage to be estimated upon a credit hour basis.

2. Students who secure less than 20 quarter honor points in the required courses of the third (freshman) year will be denied further registration in the Medical School.

3. Students who by the end of the fourth (sophomore) year have secured less than seventy quarter honor points, fifty of which were for the required courses, will be denied further registration in the Medical School.

4. Students must secure their Bachelor's degrees, i.e., 90 credits and 90 honor points in science subjects in the Medical School, together with the fulfillment of all requirements in the Arts College, before they can register for the second clinical period (clerkship). Students who had a Bachelor's degree before entering the Medical School, or who received such degree at the end of the freshman medical year, must likewise secure 90 credits and 90 honor points on science subjects in the Medical School before they can register for the second clinical period.

5. Students must maintain an average grade of C in the work of each of the three clinical periods of the combined junior and senior years, said average to be computed on a clock hour basis.

6. Students dropped under any of the above rules will not be eligible to condition examinations nor to reinstatement, excepting upon recommendation of the Students' Work Committee and affirmative vote of the Administrative Board.

REQUIREMENTS FOR GRADUATION

Compliance with the admission requirements; the attainment of the degree of Bachelor of Arts or Bachelor of Science, to which one year in medicine for the Arts degree, and two years in medicine for the Science

degree, may contribute; the completion of the full four-year period of required and elective work in the Medical School; an approved hospital internship or advanced laboratory work or public health study for one year; and good moral character, are the essentials for graduation.

The required internship insures to the practitioner of medicine a year of varied clinical experience under supervision, and gives to the public assurance of efficiency in the graduate. The alternative of advanced laboratory work is also valuable as preparation for medical practice, and for training those who desire to enter the profession of medical teaching. The alternative of public-health study meets a growing demand for trained medical sanitarians.

CLINICAL OPPORTUNITIES

THE UNIVERSITY HOSPITAL

The Elliot Memorial building, the product of a bequest of the estate of the late Dr. and Mrs. A. F. Elliot, supplemented by legislative appropriations, provides a clinic of 192 beds. Three fourths of the service is free to poor people. There are 50 per diem beds, but no private rooms.

The University Hospital seeks the highest attainable results in the treatment of patients and the training of students. Its clinical service is coöperative with the laboratory departments.

THE UNIVERSITY DISPENSARY

The dispensary is housed in Millard Hall. Its service is free. It is subdivided into medical, surgical, gynecological, obstetrical, children's, eye, ear, nose, and throat, skin, syphilis, genito-urinary, nervous and mental, orthopedic, and dental clinics. It enrolled 15,224 new patients and received 66,063 patients' visits during the year 1919.

Sections of the senior and junior classes are assigned to these clinics daily, and are trained in case-history taking, in physical examinations and diagnosis, in prescription writing, and in general therapeutic methods.

A Social Service Department has been established in relation to the hospital system and its out-patient clinics.

AFFILIATED HOSPITALS

The Minneapolis General Hospital and the City and County Hospital of St. Paul are closely affiliated with the Medical School of the University. One half of their clinical service is under the direction of the faculty.

The combined resources of these two hospitals cover some fourteen hundred beds. Every phase of clinical service is represented, and clinical material is utilized, so far as possible, by the school.

The State Hospital for the Crippled and Deformed, at Phalen Park, St. Paul, is used for instruction in orthopedic surgery. Its surgeon and his aides are members of the faculty. Interns of the University Hospital are assigned in rotation to its service.

Clinics are held in other institutions, as the Pillsbury House, the Glen Lake Sanatorium, and the St. Paul Free Dispensary.

REVISED PLAN OF CLINICAL TRAINING

With the initiation of the four-quarter system, the Medical School offers a revised method of clinical instruction which is designed to promote more individual training and more opportunities of observation and experience in the hospital.

To realize this plan, the entire period of clinical instruction, covering ten quarters in time, will be arranged in four divisions.

1. An introductory clinical division of two quarters, within which students will take didactic and laboratory courses in medicine, surgery, obstetrics, and pediatrics; advanced work in applied pharmacology; and clinics devoted to studies in the general phenomena of disease and the principles of physical diagnosis.

2. An intermediate clinical division, of two quarters, in which the emphasis will be placed upon clinical clerkships, wherein the students, under the supervision of resident instructors and teaching fellows, make and record physical examinations of patients and laboratory investigations of clinical material; and also attend general and special clinics and hospital rounds conducted by the departmental or divisional chiefs. At the same time, they will take lectures in the special branches of medicine, surgery, etc. The clinics in this period will be concentrated in the University Hospital and Dispensary.

3. An advanced division, also covering two quarters, the work of which will be chiefly elective. Among the electives will be student internships in the University Hospital, the Minneapolis General Hospital, and the City and County Hospital of St. Paul. Student interns will be resident in these hospitals, but their work in the wards will be supervised by faculty members on the hospital staffs. They will be kept in touch with the school by their attendance upon semi-weekly series of lectures upon advanced topics. Student internships will be assigned on the basis of scholarship, provided each candidate is acceptable to the hospital of his choice. Student internships can not be promised to every student of the advanced clinical division. Those not so provided will take other elective work to fill the same number of hours, 30 per week. Final examinations in all clinical branches will be held at the close of the student internship.

4. A regular internship division, covering four quarters, during which students will be registered as regular interns in approved hospitals, where their educational work will be supervised and certified to the school. A year of advanced laboratory work or a year of public-health work may be accepted in lieu of the advanced internship.

By the successive use of the four quarters of study in each year, the student may complete his clinical requirements in two and one-half instead of three years. By the rotation of class divisions, one division will be graduated at the close of each half-year.

LIBRARY

The library of the Medical School consists of the general medical library, housed in Millard Hall, and of collections of books in the departmental libraries of Surgery, Anatomy, Pathology, and Bacteriology. These departmental collections are available to students and investigators. The general library is open from 9 a.m. to 10 p.m. Some two hundred current journals are on file; 15,000 bound volumes and 33,500 unbound volumes and monographs, etc., are cataloged.

The libraries of other schools and colleges in the University and of the Hennepin County and Ramsey County medical societies are accessible to students of medicine.

PRIZES, FELLOWSHIPS, AND ASSISTANTSHIPS

The Rollin E. Cutts Prize in Surgery.—Dr. Martha Smith Cutts, '91 medical, established, as a memorial to her husband, the late Dr. Rollin E. Cutts, a fund of \$500, the income of which is awarded, in the form of a gold medal, to the member of the senior class of the Medical School who presents the best thesis evidencing original work upon an approved surgical subject.

The Shevlin Fellowship.—A fellowship, representing the income of \$10,000, established in the Graduate School by the late Thomas H. Shevlin, is open to candidates for one full year's work in medical research.

Several student assistantships and fellowships in the fundamental and clinical departments are available for properly prepared students.

FEES

The quarterly fee in the Medical School is \$60 for residents of Minnesota and \$70 for non-residents, payable at the beginning of each quarter. No fee is charged for the final hospital or advanced laboratory year.

A health fee of \$2 per quarter is paid by each student.

A deposit of \$10 each year is required as a caution fee. This fee covers the cost of unnecessary damage to school buildings, breakage and loss of laboratory apparatus and material, penalties for late registration or late payment of fees, fees for condition examinations, and rentals of post-office box and lockers. Any balance remaining from this deposit will be returned to the student at the close of each year.

Students who take less than the regular course of study may arrange their fees at the rate of \$3.00 for each weekly clock hour per quarter.

Repetition of work in course demands the repetitional payment of fees.

A fee of \$1 is payable for a condition examination; and one of \$5 for a special examination.

MICROSCOPES

Each student must be provided, by purchase or rental, and throughout the entire four years' course, with a microscope of approved quality and equipment. Arrangements may be made through the dean for the purchase of microscopes.

In the fifth and sixth years each student is required to provide himself with a hemocytometer and a stethoscope of approved form.

THE SUMMER SESSION

The summer quarter will be conducted in two terms: the first of six weeks' and the second of five weeks' duration. The session will begin about June 20.

Undergraduates in medicine are admitted in the summer session for the following purposes: (1) to secure advanced standing in courses of the regular session; (2) to remove conditions or failures; (3) to give opportunity for the concentration of medical study in the four quarters of the year; (4) for research in medical subjects.

Premedical students may use the summer session to complete their entrance requirements.

For courses of instruction offered and schedule of tuition fees, see circular of information of the summer school, for which address the dean of the Medical School.

THE GRADUATE SCHOOL IN MEDICINE

The Graduate School in Medicine offers to suitably prepared graduates in medicine courses covering two and three years, leading to the degree of Master of Science or Doctor of Philosophy in the specialty in which the major work is done. The Graduate School includes the opportunities for study and research offered by the Mayo Foundation for Medical Education and Research, at Rochester, Minnesota.

Further information may be found in the announcement of the Graduate School or in the circular of information on graduate work in medicine. Application blanks for fellowships and scholarships may be had upon request.

OPPORTUNITIES OF STUDY FOR PHYSICIANS

Physicians who desire to attend medical lectures and clinics for a limited period of time may obtain a visitor's ticket from the dean. They may enter for regular lecture and clinical courses in the Medical School upon payment of a fee of \$30 for each quarter. They may arrange for special courses of study in anatomy, physiology, experimental surgery, pathology, bacteriology, pharmacology, etc., at the same fee for each quarter, with additional charge for material used.

The school announces semi-annual physicians' clinic days, during which a full program of clinics in the University Hospital, the dispensary, and the allied municipal hospitals will be offered.

THE SCHOOL OF NURSING

The School of Nursing is conducted in connection with the University Hospital. A combined course in the College of Science, Literature, and

the Arts and the School of Nursing, leading to the degrees of Bachelor of Science and Graduate in Nursing, is also offered. This course covers a period of five years.

For further information see the bulletin of the School of Nursing.

PUBLIC HEALTH NURSING

Courses in Public Health Nursing of four and eight months are conducted in the School of Nursing.

For further information, see special circular, to be had on request.

THE COURSE IN EMBALMING

A Course in Embalming is conducted for a period of twelve weeks, commencing about January 1 each year. Certificates are issued to candidates successfully completing the course, and are accepted for state license by the State Board of Health.

Circular of information will be sent upon request.

DEPARTMENTAL STATEMENTS*

ANATOMY

Professors CLARENCE M. JACKSON, JOHN B. JOHNSTON, THOMAS G. LEE, RICHARD E. SCAMMON; Associate Professors CHARLES A. ERDMANN, ANDREW T. RASMUSSEN; Instructors LLOYD B. DICKEY, MARGARET M. HOSKINS, GUSTAV J. NOBACK; Assistant FRANK L. ROBERTS; Teaching Fellows HALBERT L. DUNN, HELEN A. MACKEEN, DAVID M. SIPERSTEIN.

Departmental Office, Institute of Anatomy

REQUIRED COURSES

- 1W. ANATOMY FOR EMBALMERS. 55 hours. ERDMANN and Assistants.
- 2f,s. ELEMENTARY HUMAN ANATOMY. School of Nursing. 33 hours; 3 credits.† MACKEEN.
- 3s. HUMAN ANATOMY. For students in Physical Education. 66 hours; 4 credits. ROBERTS.
- 5f,su-6w,su-7s,su. GROSS HUMAN ANATOMY. Dissection, including osteology. Every student required to dissect lateral half of the body. Third-year medical students. 330 hours; 18 credits. JACKSON, ERDMANN, DICKEY, NOBACK.
- 9f-10W-11s. GROSS ANATOMY. Human osteology, splanchnology and dissection of pig fetus in the first and second quarters; dissection of the human head and neck in the third quarter. Second-year dental students. 297 hours; 15 credits. JACKSON, ERDMANN, RASMUSSEN, and Assistants.
- 14w,su. HISTOLOGY AND EMBRYOLOGY. Minute structure and development of the tissues and organs. Second-year dental students. Prerequisite, Course 9. 110 hours; 6 credits. JACKSON, LEE, and Assistants.
- 103s,su. HUMAN HISTOLOGY. Microscopic study of the various tissues and organs. Third-year medical students. Prerequisite: Course 5-6. 165 hours; 9 credits. SCAMMON and Assistants.
- 107s,su. HUMAN EMBRYOLOGY. Development of the human body. Third-year medical students. Prerequisite: Course 5-6. 99 hours; 6 credits. LEE, SCAMMON, and Assistants.

* The letters f, w, s, and su indicate that the corresponding courses are offered in the fall, winter, spring, and summer quarters, respectively. Numbers joined by hyphen indicate that the course is continued through more than one quarter. Letters separated by commas indicate the repetition of the course in corresponding quarters.

† Credits, as stated in this bulletin, are on the quarter system; they are comparable with semester credits upon a ratio of three to two.

- 111f,su. HUMAN NEUROLOGY. A study of the central nervous system and sense organs. Fourth-year medical students. Prerequisite: Courses 103, 107. 99 hours; 6 credits. RASMUSSEN and Assistants.

ELECTIVE COURSES

- 121f,s. ANATOMICAL TECHNIQUE. Microtechnique; reconstruction and museum methods, etc. Fourth-, fifth-, or sixth-year medical students. Limited to sixteen students. 66 hours; 3 credits. LEE.
- 126f,w,su. ADVANCED HISTOLOGY. A study of special preparations, including practice in the identification of unknown specimens. Fourth-, fifth-, or sixth-year medical, or graduate students. Limited to sixteen students. Prerequisite: Course 103. 33 hours. 1½ credits. DICKEY, NOBACK.
- 129f-130W-131s.* TOPOGRAPHIC ANATOMY. Based upon a study of serial cross-sections of the human body. Fourth-, fifth-, or sixth-year medical, or graduate students. Prerequisite: Course 5-6. 33 hours; 2 credits. JACKSON.
- 133f,su. ANATOMY OF THE FETUS AND CHILD. A survey of prenatal and postnatal development. Fourth-, fifth-, or sixth-year medical, or graduate students. Limited to sixteen students. Prerequisites: Courses 5-6-7, 107. 66 hours, 4 credits. SCAMMON.
- 134f,w.* ANATOMY OF THE NEWBORN. A detailed laboratory study of the anatomy of the newborn. Fourth-, fifth-, or sixth-year medical, or graduate students. Prerequisite: Course 133, or equivalent. 66 hours, 3 credits. SCAMMON.
- 135f,su. PHYSICAL DEVELOPMENT OF CHILDHOOD. Lectures, with study of illustrative material. Primarily for students in the College of Education; open to medical students by permission of instructor. 22 hours, 2 credits. SCAMMON.
- 137f-138W-139s-140su.* IMPLANTATION AND PLACENTATION. Study of the implantation of the ovum, formation of the placenta, and the earlier stages of embryonic development in man and mammals. Fourth-, fifth-, or sixth-year medical, or graduate students. Limited to twelve students. Prerequisite: Course 107, or equivalent. 66 hours; 3 credits. LEE.
- 143s. APPLIED ANATOMY. Relationships, with reference to their clinical applications. Fourth-, fifth-, or sixth-year medical, or graduate students. Prerequisite: Course 5-6-7; 33 or 66 hours; 1½ or 3 credits. ERDMANN.
- 145f-146w.* SPECIAL DISSECTIONS. Dissections of special regions, including preparation of museum specimens. Fourth-, fifth-, or sixth-year

* These courses may be taken continuously through three or four quarters or in any one quarter.

medical, or graduate students. Limited to twenty-four students. Prerequisite: Course 5-6-7. 33 hours; 1½ credits. ERDMANN.

149W. EXPERIMENTAL NEUROLOGY. A study of the morphology of the central nervous system as determined by experimental methods. Fifth-, or sixth-year medical, or graduate students. Limited to five students. Prerequisite: Course III. 66 hours; 3 credits. RASMUSSEN.

153f-154W-155S-156su.* ADVANCED ANATOMY. Advanced work, largely individual in character, in gross anatomy, histology, embryology, or neurology. Fourth-, fifth-, or sixth-year medical, or graduate students. Admission only upon approval of instructor. Hours and credits to be arranged. JACKSON, JOHNSTON, LEE, RASMUSSEN, SCAMMON.

160f-162W-163su.* SEMINAR IN GROWTH OF CHILDREN. A study with graphic analysis of data on physical development of children of school age. Prerequisite: Course 135, or equivalent. Hours and credits to be arranged. SCAMMON.

201f-202W-203S-204su.* RESEARCH IN ANATOMY. Research work in gross or microscopic anatomy, neurology, histology, or embryology, for properly qualified students, graduates, or others, upon approval of any one of the instructors. Hours and credits to be arranged. JACKSON, JOHNSTON, LEE, RASMUSSEN, SCAMMON.

205f-206W-207s.* ANATOMICAL SEMINAR. Presentation and discussion of research work in progress in the department, together with reviews of current anatomical literature. Open to graduates or others upon approval of instructor. 11 hours; 1 credit. JACKSON.

BACTERIOLOGY AND IMMUNOLOGY

Professor WINFORD P. LARSON; Associate Professor ARTHUR T. HENRICI;
Instructor ANNE BENTON; Assistant ROBERT C. GREEN.

Departmental Office, Millard Hall

REQUIRED COURSES

1f,w,s,su. GENERAL BACTERIOLOGY. Culture media; methods of staining and identification; principles of sterilization and disinfection; examination of air, water, milk; relation of bacteriology to the industries. Prerequisites: general chemistry and one year of a biological science. 99 hours; 5 credits. Division for medical students; LARSON and Assistants. Division for dental students: HENRICI and Assistants. Divisions for other students: BENTON and Assistants.

3W. BACTERIOLOGY FOR EMBALMERS.

* These courses may be taken continuously through three or four quarters or in any one quarter.

101f, SU. SPECIAL BACTERIOLOGY. The pathogenic bacteria, especially in relation to definite diseases; bacteriological methods in clinical diagnosis; principles of infection and immunity. Fourth-year medical students and others. Prerequisite: general bacteriology. 66 hours; 4 credits. LARSON and Assistants.

102S. SPECIAL BACTERIOLOGY FOR DENTAL STUDENTS. The mouth flora; bacteriology of the stomatitides; bacteriology of dental caries and pulpitis, pyorrhea and alveolar abscess; systemic diseases secondary to focal infections of the mouth. Prerequisite: general bacteriology. 66 hours; 4 credits. (Offered as an elective in 1920-21; required in 1922.) HENRICI and Assistants.

ELECTIVE COURSES

103W. SPECIAL BACTERIOLOGY FOR STUDENTS OF AGRICULTURE. Bacteriology of the soil; the nitrogen-fixing bacteria; bacteria that cause plant diseases; bacterial diseases of domestic animals; the bacteriology of milk and dairying. Prerequisite: general bacteriology. 66 hours; 4 credits. HENRICI and Assistants.

105f. HOUSEHOLD BACTERIOLOGY. The decay, fermentation, and putrefaction of food-stuffs; molds; canning; bacterial food poisoning; bacteriology of the cleansing processes. Prerequisite: general bacteriology. 44 hours; 3 credits. BENTON.

114S. THE HIGHER BACTERIA. Study of morphology, cultivation, and classification of actinomycetes, yeasts and molds. Study of the mycoses. Prerequisites: general and special bacteriology. 44 hours; 3 credits. HENRICI.

116W. COURSE IN IMMUNITY. Laws of hemolysis. Quantitative relationship between antigen and antibody. Wassermann reaction. Opsonins. Vaccines. Precipitin reaction. Blood grouping. Abderhalden reaction. Anaphylaxis. Fifth- and sixth-year medical students. Limited to ten students. 44 hours; 3 credits. LARSON.

117S. PATHOGENIC PROTOZOA. Study of parasitic protozoa of man, including spirochaets; their morphology and life histories; intermediate hosts as agents in the spread of disease; cultural methods. Prerequisites: general and special bacteriology; Animal Biology 45 and 107. 44 hours; 3 credits. LARSON.

118f. MORPHOLOGY AND TAXONOMY OF BACTERIA. Cytology of bacteria; their origin and systematic position; consideration of morphological, biochemical and immunological characters as data for classification; variations and mutations in bacteria; the biometrical method as applied to bacteriology. Prerequisites: general and special bacteriology. 44 hours; 3 credits. HENRICI.

- 119f. BACTERIOLOGICAL CHEMISTRY. Chemical analyses of bacteria; physical agents influencing bacterial metabolism (salinity, hydrogen-ion concentration, surface tension, etc.); factors stimulating enzyme production; protein, carbohydrate, and fat metabolism of bacteria; nitrogen fixation. Prerequisites: general and special bacteriology; physiological chemistry or phytochemistry. 66 hours; 4 credits. GREEN and Assistant.
- 120W. CONTINUATION OF 119f. Bacterial toxins; "split proteins"; bacterial activity in the alimentary tract; pigment production; autolysis of bacteria; immuno-chemistry; permeability of bacterial cells; behavior of bacteria toward electricity. 66 hours; 4 credits. GREEN and Assistant.
- 150f-151W or 150W-151s. ADVANCED BACTERIOLOGY. An advanced course giving additional work in bacteriology and the opportunity of working* out special problems. Prerequisite: general and special bacteriology. Limited to ten students. Arrange credits. LARSON, HENRICI.
201. RESEARCH IN BACTERIOLOGY. Graduate students of the necessary preliminary training may elect research, either as majors or minors, in bacteriology. Hours and credits arranged. LARSON, HENRICI.
203. SEMINAR IN BACTERIOLOGY. 1 credit. Staff.

PHYSIOLOGY

Professors ELIAS P. LYON, FREDERICK H. SCOTT; Associate Professors RICHARD OLDING BEARD, JESSE F. MCCLENDON; Assistant Professors FRANCIS B. KINGSBURY, CHAUNCEY J. V. PETTIBONE; Instructors CHARLES C. GAULT, ESTHER GREISHEIMER; Teaching Fellows

Departmental Office, Millard Hall

REQUIRED COURSES

- 1f-2w-3s. PHYSIOLOGY AND HYGIENE. A course for teachers, designed to give a helpful knowledge of the human subject. Lectures and laboratory work. 3 hours on Saturday; 6 credits. BEARD and Assistant.
- 4f,w,s,su. HUMAN PHYSIOLOGY. A course offered to students of the College of Science, Literature, and the Arts, to nurses, students in home economics, etc. Lectures and laboratory work. Prerequisites: elementary biology and chemistry. 88 hours; 5 credits. LYON, BEARD, GREISHEIMER.
- 5f,w,s,su. Same as Course 4 without laboratory work. Pharmacy students. 4 credits. LYON, BEARD, and Assistants.
- 6s,su. PHYSIOLOGIC CHEMISTRY. For students of College of Dentistry and others. Prerequisite: organic chemistry. 55 hours; 3 credits. PETTIBONE and Assistants.

- 7s. HUMAN PHYSIOLOGY. Dental students and others. Prerequisites: organic chemistry and anatomy or zoology. 108 hours; 6 credits. SCOTT et al.
- 100f,su-101w,su. PHYSIOLOGIC CHEMISTRY. The components of the animal body; foods, digestion, the excreta and metabolism. Third-year medical students and others. Prerequisite: organic chemistry. 198 hours; 12 credits. PETTIBONE, KINGSBURY, GREISHEIMER.
- 103f,su. PHYSIOLOGY OF MUSCLE, NERVE, BLOOD, CIRCULATION, DIGESTION, RESPIRATION, METABOLISM, NUTRITION AND EXCRETION. Fourth-year medical students and others. Prerequisites: organic chemistry and animal biology. 165 hours; 10 credits. SCOTT, McCLENDON, and Assistants.
- 104w,su. PHYSIOLOGY OF THE NERVOUS SYSTEM AND SPECIAL SENSES. Fourth-year medical students and others. Prerequisites: organic chemistry and animal biology. 88 hours; 6 credits. LYON, SCOTT, BEARD, McCLENDON.

ELECTIVE COURSES

- 110f. PHYSICAL CHEMISTRY OF VITAL PHENOMENA. Osmotic pressure, surface tension, electric conductivity, hydrogen-ion concentration, bioelectric currents, negative osmosis. Prerequisites: animal biology and two courses in chemistry. 66 hours; 3 credits. McCLENDON.
- 111w. MINERAL METABOLISM. Function of inorganic constituents of the body and changes in mineral metabolism in disease. Prerequisite: 110f or arrange. 66 hours; 3 credits. McCLENDON.
- 112s. VITAMINES. Physico-chemical conditions necessary for the preservation of the vitamins during the storage, cooking, or other preparation of foods. Prerequisites: 111w. 66 hours; 3 credits. McCLENDON.
- 113f,w,s,su. PROBLEMS IN PHYSIOLOGY. Arranged by instructors with qualified students. Each student will be assigned a topic for special laboratory study, leading in some cases to original investigation. Conferences and reading. Prerequisites: Courses 103-4 or equivalent. 66 hours; 3 credits or arrange. LYON, SCOTT, McCLENDON, GREISHEIMER.
- 131w. ADVANCED PHYSIOLOGY OF MUSCLE, BLOOD, CIRCULATION, AND DIGESTION. Alterations due to physiologic conditions. Prerequisite: Physiology 103. 66 hours; 3 credits. SCOTT.
- 132s. ADVANCED PHYSIOLOGY OF RESPIRATION, EXCRETION, METABOLISM, NERVOUS SYSTEM, AND SENSE ORGANS. Conferences and laboratory work. Prerequisite: Physiology 104. 66 hours; 3 credits. SCOTT.
- 137f,s. FOODS AND PRACTICAL DIETETICS. A study of human foods and food values; of the principles of food selection; of caloric indices and balanced dietaries. Exercises in the practical preparation of foods. Prerequisite: physiologic chemistry. Limited to twelve students. 66 hours; 3 credits. BEARD, THOMAS.

- 138w. **PHYSIOLOGY OF DEVELOPMENT.** The physiology of the ovum, embryo, fetus; the functions of menstruation, ovulation, pregnancy, parturition, and lactation; the functional characteristics of birth, infancy, childhood, adolescence, maturity, and old age. Prerequisite: Physiology 103-4. 22 hours; 2 credits. BEARD.
- 153f,w,s,su. **ADVANCED PHYSIOLOGIC CHEMISTRY.** Course arranged by instructors with qualified students for special work. May be taken one or more quarters. Prerequisite: Course 100-101. Hours and credits arranged. KINGSBURY, PETTIBONE.
- 161f. **URINALYSIS.** Advanced methods. Prerequisite: Physiology 101. 66 hours; 3 credits. PETTIBONE.
- 162w. **CHEMICAL ANALYSIS OF BLOOD.** The most recent methods in chemical analysis of blood. Limited to twelve students. Prerequisite: Physiology 101. 66 hours; 3 credits. PETTIBONE.
- 163s. **METABOLISM.** Lectures and laboratory work on special phases of metabolism. Lectures may be taken alone; number of students unlimited; laboratory course limited to ten students. Prerequisite: Physiology 101. 66 hours; 3 credits. PETTIBONE.
- 201f,w,s. **SEMINAR IN PHYSIOLOGY AND PHARMACOLOGY.** For instructors and advanced students. 11 hours; 1 credit. LYON, HIRSCHFELDER, and Staff.
- 203f,w,s,su. **RESEARCH IN PHYSIOLOGY.** Hours and credits arranged. LYON, SCOTT, McCLENDON.
- 205f,w,s,su. **RESEARCH IN PHYSIOLOGIC CHEMISTRY.** Hours and credits arranged. KINGSBURY, PETTIBONE.
- 208f. **SEMINAR IN PHYSIOLOGIC OPTICS.** For graduate students and sixth-year medical students. 22 hours; 2 credits. LYON.
- 210f. **PHYSIOLOGIC OPTICS.** A laboratory course. For graduate and sixth-year medical students. 33 hours; 1 credit. LYON.

PHARMACOLOGY

Professor ARTHUR D. HIRSCHFELDER; Associate Professor EDGAR D. BROWN; Instructor PERCY A. WARD; Assistant ALLEN T. NEWMAN; Teaching Fellow JOHN P. QUIGLEY.

Departmental Office, Millard Hall

REQUIRED COURSES

- 1f,w. **ELEMENTARY PHARMACOLOGY.** A study of drugs; definition of terms; systems of weights and measures; methods of administration, principles of dosage, etc. For nurses and others. 44 hours; 4 credits. BROWN, QUIGLEY.

- 4s. COURSE IN PHARMACOLOGY. The study of drugs, including the discussion of their physiologic, pharmacologic, and therapeutic actions. For second-year dental students. 44 hours; 4 credits. BROWN.
- 6s. EXPERIMENTAL PHARMACOLOGY. Experiments upon the effects of the important heart and nerve stimulants, sedatives, purgatives, and antiseptics. Offered to dental and pharmacy students and nurses. 22 hours; 1 credit. HIRSCHFELDER, BROWN, NEWMAN.
- 102s,su. GENERAL PHARMACOLOGY. The principles underlying the structure, physico-chemical properties, physiologic, therapeutic, and toxic actions of substances, natural or synthetic, used as medicines. Fourth-year medical students. 33 hours; 3 credits. HIRSCHFELDER, BROWN.
- 104s. EXPERIMENTAL PHARMACOLOGY. Exercises illustrating the preparation and action of medicines, their relation to chemical structure, and their mode of administration. Fourth-year medical students. 66 hours; 3 credits. HIRSCHFELDER, BROWN, WARD.
- 105su,w. GENERAL PHARMACOLOGY AND THERAPEUTICS. A detailed study of drugs important in clinical practice, covering the relations of chemical structure to physiologic and therapeutic action and modes of application in medicine. Part I. Fifth-year medical students. 22 hours; 2 credits. HIRSCHFELDER, BROWN.
- 106f. GENERAL PHARMACOLOGY AND THERAPEUTICS. Same as Course 105, in continuation. Part II. Fifth-year medical students. 22 hours; 2 credits. HIRSCHFELDER, BROWN.
- 107f,w,s,su. THERAPEUTIC CONFERENCE. Discussion of the treatment of diseases based upon a study of notes of typical cases. Advanced clinical division, 11 hours. HIRSCHFELDER, BROWN.
- 108f,su. PRESCRIPTION WRITING. The principles of prescription writing; studies in the flavoring, coloring, and incompatibles of drugs. Fifth-year. 11 hours. BROWN.

ELECTIVE COURSES

- 109f,w,s,su. PHARMACOLOGICAL PROBLEMS. An intensive experimental study of some single topic in pharmacology, with a critical review of the literature bearing upon the subject. Hours and credits arranged. HIRSCHFELDER, BROWN.
- 110f,w,s,su. DETECTION OF POISONS. Hours and credits arranged. HIRSCHFELDER, BROWN.
201. SEMINAR IN PHYSIOLOGY AND PHARMACOLOGY. Reviews of research and recent literature bearing upon physiologic and pharmacologic subjects. Open to qualified graduate or undergraduate students. 11 hours; 1 credit. Staff.

203. RESEARCH IN PHARMACOLOGY. Open to graduate and advanced students. Hours and credits arranged. HIRSCHFELDER, BROWN.

PATHOLOGY AND PUBLIC HEALTH

Professors HAROLD E. ROBERTSON, JOHN SUNDWALL; Associate Professor ELEXIOUS T. BELL; Assistant Professors MOSES BARRON, MARGARET WARWICK; Instructor THEODORE H. SWEETSER.

Departmental Office, Institute of Anatomy

REQUIRED COURSES

- 4f. PATHOLOGY FOR STUDENTS IN DENTISTRY. The principles of general pathology with special consideration of diseases peculiar to the mouth and teeth. 99 hours; 6 credits. ROBERTSON, WARWICK, SWEETSER.
- 101w. PATHOLOGY. Part I. The general principles governing pathologic changes, including disturbances of the circulation and metabolism; inflammation, regeneration, and repair; tumor formation. Fourth-year medical students. Prerequisites: histology, embryology, and special bacteriology. 165 hours; 9 credits. ROBERTSON, BELL, BARRON, WARWICK.
- 102s. PATHOLOGY. Part II. The study of the pathologic processes of infectious diseases, such as diphtheria, typhoid fever, etc.; the special pathology of lesions in various organs, systems of organs and tissues of the body. Fourth-year medical students. Prerequisite: Pathology, Part I. 165 hours; 9 credits. ROBERTSON, BELL, BARRON, WARWICK.
- 103f,w. PREVENTIVE MEDICINE AND HYGIENE. The principles of personal and communal hygiene and of general procedures for the protection of the public health. Fifth-year medical students. 33 hours; 3 credits. SUNDWALL.
- 104su,f,w,s. AUTOPSIES. Technique of autopsies; making records; examination of fresh organs. Study of observed lesions microscopically. Three or four students called to each post-mortem; excused from classes. Each candidate for M.D. degree must take part in at least four autopsies. Fifth- and sixth-year medical students. STAFF.

ELECTIVE COURSES*

105. ADVANCED CLINICAL PATHOLOGY. Practical studies on spinal fluids, including colloidal gold and Nonne reactions, and other special methods for examination and diagnosis of body tissues and fluids. Fifth- and sixth-year medical students.

* Assignment of elective courses to individual staff members will appear in quarterly programs.

106. **PATHOLOGIC TECHNIQUE.** Methods of preparation of microscopic and gross specimens; practice with freezing microtome, celloidin and paraffin embedding methods, general and special stains, preparation of museum specimens, etc. Limited to ten students. Fourth-, fifth-, and sixth-year medical students. Prerequisite: Pathology 101. 33 hours; 1 credit.
- 107f,w,s. **APPLIED PATHOLOGY.** Laboratory studies in the examination of routine operative and autopsy specimens, with investigation of special associated problems. Credit is to be judged by character and amount of work accomplished. Dates and hours arranged.
108. **DIAGNOSIS OF TUMORS.** The study of tumors and other pathologic conditions simulating tumor formation. Fifth- and sixth-year medical students. Prerequisite: Pathology 102.
109. **CLINICAL PATHOLOGICAL CONFERENCE.** Presentation and comparison of clinical data on selected cases by clinicians, and of the pathological specimens from these same cases, by the pathologist, with discussions of etiology and diagnosis. One hour per week in each quarter.
- ELECTIVES** in coöperation with the respective clinical departments. Studies of the pathologic conditions found in the diseases peculiar to each of the specialties listed below. Lesions demonstrated by gross and microscopic specimens.
110. **GYNCOLOGICAL PATHOLOGY.**
111. **NEUROPATHOLOGY.**
112. **SURGICAL PATHOLOGY.**
113. **PATHOLOGY OF DISEASES OF THE EYE, EAR, NOSE, AND THROAT.**
114. **PATHOLOGY OF DISEASES OF CHILDREN.**
115. **PATHOLOGY OF DISEASES OF THE SKIN.**
201. **RESEARCH.** Graduate students, of the necessary preliminary training, may elect research, either as major or minor in pathology. Hours and credits to be arranged.

MEDICINE

Professors LEONARD G. ROWNTREE, ARTHUR S. HAMILTON, ARTHUR A. SWEENEY, S. MARX WHITE; Research Professor THOMAS B. HARTZELL; Associate Professors JAMES S. GILFILLAN, JOHN P. SCHNEIDER, SAMUEL E. SWEITZER, HENRY L. ULRICH; Assistant Professors ARCHIBALD H. BEARD, JOHN BUTLER, CHARLES D. FREEMAN, EDWIN L. GARDNER, ALEXANDER R. HALL, HARRY G. IRVINE, ERNEST M. HAMMES, ANGUS W. MORRISON, GEORGE M. OLSON, ERNEST T. F. RICHARDS, ROBERT I. RIZER, GRETE EGERER SEHAM, FREDERICK W. WITTICH, Lecturer HENRY WIREMAN COOK; Instructors CHARLES R. DRAKE,

OLGA S. HANSEN, HENRY N. KLEIN, JOHN A. LEPAK, CHAUNCEY A. MCKINLAY, ERNEST S. MARIETTE, HENRY E. MICHELSON, CHARLES E. NIXON, HARRY OERTING, THOMAS A. PEPPARD, FREDERICK H. K. SCHAAF, CHARLES B. WRIGHT; Research Assistant WILLIAM A. GREY; Assistants ERIC T. W. BOQUIST, EDWARD C. GAGER, WILLIAM H. HENGSTLER, KANO IKEDA, JOHN C. KOCH, JOSEPH C. MICHAELS, HENRY ODLAND, CLYDE A. UNDINE, ARCHIBALD W. WARD, SAMUEL A. WEISMAN, FRANK W. WHITMORE, THOMAS ZISKIN; Teaching Fellows SOLOMON FINEMAN, JOHN C. MCKINLEY; Health Service Fellow CHARLES J. HUTCHINSON.

Departmental Office, Millard Hall

REQUIRED COURSES

- 50s. PHYSICAL DIAGNOSIS. Lecture on general symptomatology and on methods of physical examination, diagnosis, and record; with demonstrations and section teaching in the dispensary. Fourth year. 66 hours. ROWNTREE, SCHNEIDER, and Assistants.
- 51w,su,52f. THE PRINCIPLES AND PRACTICE OF MEDICINE. A systematic consideration of the subject, exclusive of neurology and neurologic diagnosis, q.v.; illustrated, so far as possible, by clinical material. Fifth year. 66 hours. ROWNTREE, WHITE, GARDNER, RICHARDS, RIZER, WITTICH, COOK.
- 53f,w,su. PHYSICAL DIAGNOSIS AND CASE-TAKING. Conducted, with sections of the class, in the following dispensary clinics: (1) cardiac and vascular diseases; (2) respiratory disease and tuberculosis; (3) metabolic diseases; (4) gastro-intestinal diseases; (5) nervous diseases; (6) tuberculosis; (7) dermatology and syphilis. See also Courses 77 and 81. Fifth year. 66 hours. IRVINE, SCHNEIDER, SWEITZER, MORRISON, OLSON, WITTICH, HANSEN, SCHAAF, WRIGHT.
- 54su,f. CLINICAL CHEMISTRY AND MICROSCOPY. Methods of laboratory examination for diagnostic purposes. Fifth year. 66 hours. BEARD.
- 55su,f. PHYSICAL DIAGNOSIS. A course of lectures in elaboration of the practical work in the Out-Patient Service. Fifth year. 11 hours. SCHNEIDER, RIZER, WITTICH.
- 56su,w. PRACTICAL THERAPY AND THERAPEUTIC TECHNIQUE. A study of special methods of therapeutics. Fifth year. 11 hours. MCKINLAY, FINEMAN.
- 57f,w,su. CLINIC IN MEDICINE. Conducted in the University Hospital. First clinical period for two quarters. 22 hours. RICHARDS, RIZER.
- 58f,w,s,su. CLINIC IN MEDICINE. At University Hospital. Second clinical period. 22 hours. ROWNTREE, WHITE, and Staff.

- 59f,w,s,su. SECTION CLINICS IN MEDICINE. Conducted in the Minneapolis General Hospital; a part of the course in required clinics. Fifth year. 11 hours. GARDNER.
- 60f. MOUTH INFECTIONS. The typical infections of the oral cavity and their causal relations to disease. Second or third clinical period. 8 hours. HARTZELL.
- 62f. MEDICAL JURISPRUDENCE. The principles of law, the rules of evidence and the duties of physicians in medico-legal cases. Second or third clinical period. 16 hours. SWEENEY.
- 63f,w,s,su. CLINIC IN MEDICINE. A study of cases and case histories in the University Hospital service. Advanced clinical period. 22 hours. ROWNTREE, WHITE, and Staff.
- 65f,w,s,su. CLINICAL CLERKSHIP. The personal observation of patients in hospital, taking and recording of case histories and making of provisional diagnoses. Intermediate clinical period. 154 hours. The Staff.

ELECTIVE COURSES*

- 100f,w,s,su. STUDENT INTERNSHIP. Resident study in an assigned hospital, covering the last two quarters of the senior year, under direction of the faculty members of the hospital staff; credit for medicine, 264 hours. The Staff.
101. ASSISTANTSHIP IN THE DISPENSARY. In any of the services in medicine. Open to two students, who have completed clinical clerkships in medicine in each service and in each quarter. Staff.
103. CLINICS IN MEDICINE. Bedside studies at the City and County Hospital, St. Paul. Limited to ten students. GILFILLAN, HALL.
105. CLINICS IN MEDICINE. Bedside studies at the Minneapolis General Hospital. Limited to six students. ULRICH.
106. ADVANCED PHYSICAL DIAGNOSIS. Minneapolis General Hospital. Limited to six students. GARDNER.
107. GRAPHIC RECORDING AND FUNCTIONAL DIAGNOSIS OF CARDIO-VASCULAR DISEASES. A study of the use of the polygraph and electrocardiograph. Limited to six students. WHITE.
108. STUDIES OF DISEASES OF THE CIRCULATION. Informal discussion and examination by individual students of selected cases. Circulatory insufficiency, irregularity, organic diseases. Study of polygrams, electrocardiograms, vascular diseases, blood pressure, cardio-vascular medication. Limited to six senior and graduate students. WHITE.

* Electives in medicine are usually repeated each quarter. See quarterly programs.

- 109. ADVANCED PHYSICAL DIAGNOSIS OF THE CHEST. Practical work on tuberculous patients at available hospitals. Limited to six students. WITTICH, Associates.
- 110. STUDIES IN METABOLISM, CLINICAL AND EXPERIMENTAL. Limited to six students. ROWNTREE and Staff.
- 111. PROBLEMS IN ADVANCED MEDICAL DIAGNOSIS. Limited to four students. ULRICH.
- 112. PROBLEMS IN CARDIAC FUNCTION. Limited to six students. University Dispensary. HANSEN.
- 114. EXTERNSHIP IN MEDICINE. Extension of clerkship. Arrange.

DIVISION OF NERVOUS AND MENTAL DISEASES

REQUIRED COURSES

- 69f,w. NEUROLOGY AND NEUROLOGIC DIAGNOSIS. Methods of examination of the nervous system; the etiology, pathology, diagnosis, and treatment of the special diseases of the nervous system. 33 hours. HAMILTON, HAMMES, MORRISON.
- 70su,w. PSYCHIATRY. Methods of modern psychiatry, with the diagnosis and treatment of the various mental disorders. Sixth year. 11 hours. HAMILTON.
- 71f,w,s,su. CLINICAL NEUROLOGY AND PSYCHIATRY. Section clinics in nervous and mental diseases, conducted at the University Hospital and the Minneapolis General Hospital. 11 hours. HAMILTON, NIXON.
- 75f,w,s,su. NERVOUS AND MENTAL DISEASES. The personal observation and study of cases in the University Dispensary; a part of the course of required clinics. Sixth year. 8 hours. MORRISON, NIXON, MCKINLEY.
- 77. PHYSICAL DIAGNOSIS AND CASE-TAKING. Studies conducted with sections of the class in neurology; in the Dispensary; a part of Course 53. HAMILTON and Staff.

ELECTIVE COURSES

- 113. PATHOLOGY OF THE NERVOUS SYSTEM. The relations existing between pathologic lesions and signs and symptoms; the chief neurone systems and the principles underlying their degeneration. Limited to four students. Prerequisites: Courses 69 and 70. HAMILTON, NIXON, MCKINLEY.
- 115. ORGANIC NERVOUS DISEASES. Advanced diagnosis of nervous diseases, with a view of giving each student practical experience in all the chief diagnostic procedures employed in the study of nervous diseases. Limited to four students. Prerequisites: Courses 69 and 70. HAMILTON and Staff.

116. SYPHILITIC NERVOUS AFFECTIONS. The diagnosis and treatment of the expressions of syphilis in the central nervous system, referring particularly to dementia paralytica and tabes dorsalis. Limited to six students. HAMMES.
118. REGIONAL DIAGNOSIS. A didactic and clinical conference on the regional diagnosis of lesions of the nervous system. Limited to four students. Prerequisite: Course 69. MORRISON, McKINLEY.
119. CLINICAL ASSISTANTSHIP, in nervous and mental diseases in the Out-Patient Department. Sixth year. Open to two students. MORRISON, NIXON, McKINLEY.

DIVISION OF DERMATOLOGY

- 79su,w,8of. COURSE IN DERMATOLOGY. Clinical lectures upon the common skin diseases and syphilis, including diagnosis and treatment. Fifth year. 22 hours. SWEITZER.
- 81f,w,s,su. PHYSICAL DIAGNOSIS AND CASE-TAKING. Sections of the class in dermatology and syphilis, in the Dispensary; a part of Course 53. SWEITZER, BUTLER, IRVINE, OLSON.
- 83f,w,s,su. CLINIC IN DERMATOLOGY. The practical study of cases of skin and syphilitic disease, in the Out-Patient Department; a part of the course of required clinics. Sixth year. 8 hours. SWEITZER, BUTLER, IRVINE, OLSON.

ELECTIVE COURSES

121. ASSISTANTSHIP IN DERMATOLOGY, in the Out-Patient Department. Open to two students in each quarter. SWEITZER, BUTLER, IRVINE, OLSON.
123. WARD CLINICS IN DERMATOLOGY. Conducted in the City and County Hospital, St. Paul. Limited to ten students. The Staff.

SURGERY

Professors ARTHUR C. STRACHAUER, ARTHUR J. GILLETTE, CHARLES H. MAYO; Associate Professors ALEXANDER R. COLVIN, J. FRANK CORBETT, EMIL S. GEIST, CHARLES A. GRIFFITH, ARTHUR A. LAW, ARCHIBALD MACLAREN, ARTHUR T. MANN, CHARLES A. REED, HARRY P. RITCHIE, JOHN T. ROGERS, FRANKLIN R. WRIGHT; Assistant Professors ROBERT G. ALLISON, PAUL F. BROWN, CARL C. CHATTERTON, LOUIS E. DAUGHERTY, JAMES W. GEORGE, JAMES A. JOHNSON, OSCAR OWRE, FREDERICK H. POPPE, GILBERT J. THOMAS, ARCHA E. WILCOX, HARRY B. ZIMMERMAN; Instructors JOHN S. ABBOTT, WALLACE COLE, WALTER A. FANSLER, PAUL W. GIESSLER, HUGO J. HARTIG, WALTER J. KREMER, FREDERICK A. OLSON, EMIL C. ROBITSHEK, ROSCOE C. WEBB, ANTON G. WETHALL; Assistants M. KELLER KNAUFF, JOSEPH J. STRATTE;

Teaching Fellows ANGUS L. CAMERON, ARTHUR A. ZIEROLD; Health Service Fellow CHESTER O. TANNER.

Departmental Office, Millard Hall

REQUIRED COURSES

- 51su-f,f-w. PRINCIPLES OF SURGERY. A study of surgical inflammations, etc.; illustrated by gross and microscopic preparations from the living subject and from experimental courses. Lectures and demonstrations. Fifth year. 44 hours. CORBETT, RITCHIE.
- 53f,w. GENERAL SURGERY. The diseases and injuries of tendons, fasciae, bursae, blood vessels, nerves, brain, and meninges. Lectures and demonstrations. Fifth year. 33 hours. LAW.
- 55w-56s,su. REGIONAL SURGERY. The practical surgery of the anatomical regions of the body, head, neck, thorax, abdomen, and extremities. Lectures and demonstrations. 44 hours. Fifth year. STRACHAUER.
- 58s. FRACTURES AND DISLOCATIONS. Lectures and demonstrations. Sixth year. 22 hours. LAW, DAUGHERTY, WILCOX.
- 59f,w,su. DIAGNOSTIC CLINIC. A series of clinics upon the diagnosis of surgical conditions as presented in the Out-Patient Department. Fifth year. 17 hours. JOHNSON.
- 63f,w,s,su. CLINICAL CLERKSHIPS. The personal study of assigned hospital patients under supervision of the instructor; case histories; laboratory examinations; provisional diagnoses, with suggestions as to therapy; attendance at operation of such studied cases and observation of post-operative management. Practical instruction in anesthesia. 88 hours. Staff.
- 65f,w,s,su. MINOR SURGICAL CLINICS. Course conducted with class sections on three days in each week at the Out-Patient Department; a part of the course of required clinics. 33 hours. JOHNSON and Staff.
- 66s. MEDICAL ETHICS AND ECONOMICS. 2 hours. ABBOTT, MACLAREN.
- 69f,w,s,su. STUDENT INTERNSHIP. A course of resident study in an assigned hospital, covering the last two quarters of the senior year, under direction of the faculty members of the hospital staff. 176 hours. Staff.

ORTHOPEDIA

- 70f,w,s,su. ORTHOPEDIC SURGERY. A course of clinical lectures, demonstrations and operations conducted in each quarter, with divisions of class; at the Hospital for Crippled and Deformed Children at Phalen Park. 33 hours. GILLETTE, CHATTERTON.

71f,w,s,su. ORTHOPEDIC CLINIC. A study of cases of orthopedic disease and treatment at the Out-Patient Department, with class sections; a part of the course of required clinics. 8 hours. REED, GIESSLER.

72f,s. ORTHOPEDIC SURGERY. A course of lectures covering orthopedic conditions in the adult, with lantern slides and demonstrations. 11 hours. GEIST.

UROLOGY

73f,s. GENITO-URINARY DISEASES. The etiology, diagnosis, and treatment of this group of diseases. A course of lectures. Sixth year. 18 hours. WRIGHT.

77f,w,s,su. GENITO-URINARY CLINIC. The observation, examinations, and treatment of patients in the Out-Patient Department, at three weekly sessions; a part of the course of required clinics. 8 hours. THOMAS, KREMER, WETHALL.

ROENTGENOLOGY

79su,w. COURSE IN ROENTGENOLOGY. Lectures, demonstrations, and plate reading. 11 hours. ALLISON.

ELECTIVE COURSES*

67. CADAVER SURGERY. The technique and performance of the various standard operations upon the cadaver. CORBETT, POPPE.

101. MINOR SURGERY. Clinical courses conducted in the Out-Patient Department. JOHNSON, HARTIG, ROBITSHEK, STRATTE.

102. PROCTOLOGY. A clinical course conducted in the Out-Patient Department. FANSLER.

103. ANIMAL SURGERY. A study of surgical technique by cardinal operations upon animals. CORBETT.

104,a,b,c, etc. DIAGNOSTIC AND OPERATIVE CLINICS. Conducted at the University Hospital. STRACHAUER, LAW, MACLAREN, RITCHIE, JOHNSON, OLSON.

105a,b,c, etc. DIAGNOSTIC AND OPERATIVE CLINICS. Held at the Minneapolis General Hospital. MANN, CORBETT, BROWN, POPPE.

106. EXTRACTION OF TEETH. Course conducted in the College of Dentistry. GRIFFITH.

107. GENITO-URINARY CLINIC. Held at the University Dispensary. THOMAS, KREMER, WETHALL.

108. UROLOGIC CLINIC. A course including endoscopy and cystoscopy, at the Minneapolis General Hospital. OWRE.

*Electives in surgery usually repeated each quarter. See quarterly programs.

109. GENITO-URINARY CLINIC. Conducted at the Minneapolis General Hospital. WRIGHT, OWRE, KREMER.
110. ORTHOPEDIC CLINIC. Conducted at the University Dispensary. REED, GIESSLER.
111. ADVANCED CLERKSHIP IN SURGERY. Sixth year. Arrange. Staff.
- 215W,S. THE SURGERY OF THE KIDNEY. A review of the embryology, anatomy, and pathology. Diagnosis; cystoscopic study, including kidney function estimation; and pyelography. Operative technique. Studies of special problems. STRACHAUER.
- 216W-217S. THE SURGERY OF THE BRAIN AND SPINAL CORD. Operative technique. Studies of special problems. Prerequisites: Anatomy 103; Medicine 113. STRACHAUER.

OBSTETRICS AND GYNECOLOGY

Professor JENNINGS C. LITZENBERG; Associate Professors FRED L. ADAIR, JOHN L. ROTHROCK; Assistant Professors LEE W. BARRY, WILLIAM H. CONDIT, JALMAR H. SIMONS; Instructors J. WARREN BELL, JAMES F. HAMMOND, E. MENDELSSOHN JONES, RAE T. LAVAKE, CLARENCE O. MALAND, ALBERT G. SCHULZE, IVAR SIVERTSEN, FREDERICK J. SOUBA, THURSTON W. WEUM, HERBERT M. N. WYNN; Assistants CLARENCE E. WILLCUTT; Teaching Fellows LEROY A. CALKINS, CASSIUS M. COLDREN; Health Service Fellow SAMUEL B. SOLHAUG.

Departmental Office, Institute of Anatomy

REQUIRED COURSES

- 51su,f. OBSTETRICS. The physiology of pregnancy, labor and the puerperium. Fifth year. 33 hours. ADAIR, BARRY, CONDIT, LAVAKE.
- 52f,w. OBSTETRICS. The pathology of pregnancy, labor and the puerperium. Prerequisite: Course 51. Fifth year. 33 hours. ADAIR, BARRY, CONDIT, LAVAKE.
- 53s,f. OPERATIVE OBSTETRICS. A study of operative obstetrics. Prerequisites: Courses 51 and 52. 11 hours. LITZENBERG, ADAIR.
- 54su,f. GYNECOLOGY. A study of diagnostic methods in diseases of women. Fifth year. 11 hours. LITZENBERG, ADAIR, BARRY.
- 55w. GYNECOLOGY. A study of diseases of women. Prerequisite: Course 54. 22 hours. LITZENBERG, ADAIR, BARRY.
- 56su,w,57f,s. OBSTETRICS AND GYNECOLOGY. The pathology of pregnancy, labor and the puerperium, and of diseases of women. Lectures, demonstrations, class clinics, and case analysis. Prerequisites: Courses 51, 52, 53, 54, 55. 44 hours. LITZENBERG, ADAIR, BARRY.

- 58su,f,w,s. CLINICAL CLERKSHIP IN OBSTETRICS AND GYNECOLOGY. Observation and study of assigned patients in University Hospital and Out-Patient Department under supervision; case histories; physical examinations, laboratory examinations and provisional diagnoses; parturition clinics; operations; manikin demonstrations. 44 hours. Staff.
- 59s,f,w,su. CLINICS IN OBSTETRICS AND GYNECOLOGY. Demonstrations and personal observations in diagnosis and treatment of cases in the University Dispensary. Part of required section clinics. 17 hours. Dispensary Staff.
- 60su,f,w,s. PARTURITION CLINICS. Sections of the class on call for parturition clinics at the General Hospital, Minneapolis. Fifth year. ADAIR and Associates.
- 61su,f,w,s. CLINICS IN OBSTETRICS AND GYNECOLOGY. Conducted in the Minneapolis General Hospital; a part of the required section clinics. Fifth year. Once a week. 11 hours, one section. Staff.
- 62su,f,w,s. Same as Course 61, once a week, 11 hours, one section. Staff.

ELECTIVE COURSES*

- 101f,w,s,su. STUDENT INTERNSHIP. Resident study in an assigned hospital, under direction of the faculty members of the hospital staff. Part of a general student internship giving 88 hours credit in Obstetrics and Gynecology. Staff.
103. OBSTETRICS AND GYNECOLOGIC CLINIC. Diagnosis and treatment of obstetric conditions and diseases of women at the University Hospital. Limited to six students. Hours and credits arranged. LITZENBERG, BARRY, WEUM, WYNNE.
104. GYNECOLOGIC CLINIC. Diagnosis and treatment of diseases of women. St. Paul Dispensary. Two students. ROTHROCK, BARRY.
105. GYNECOLOGIC CLINIC. Diagnostic and operative clinic in diseases of women. City and County Hospital, St. Paul. JONES, HAMMOND.
106. OBSTETRIC CLINIC. The diagnosis and treatment of obstetric conditions. City and County Hospital, St. Paul. BARRY, SCHULZE.
108. CLINICS IN OBSTETRICS AND GYNECOLOGY. Diagnosis and treatment of obstetric conditions and diseases of women. Minneapolis General Hospital. SIMONS, LAVAKE, MALAND, SOUBA.
109. APPLIED ANATOMY OF THE PELVIS. The anatomy of the female generative organs using anatomical specimens, models, and the patient for demonstration. University Dispensary. LAVAKE.

* Elective courses in this department are usually repeated each quarter. See quarterly programs.

110. OPERATIVE OBSTETRICS. Manikin demonstrations of obstetric operations and special procedures. Prerequisite: obstetric clinical clerkship. Sixth year. Limited to six students. BARRY.
111. ADVANCED PATHOLOGY OF THE FEMALE PELVIS. Gross and microscopic study of the pathological conditions of the female generative organs. Prerequisite: general and special pathology. ADAIR.
112. PATHOLOGIC OBSTETRICS. Minneapolis General Hospital. Demonstration of abnormal obstetric cases and operative procedure. One clinic each week. Limited to six senior students. ADAIR.
113. OPERATIVE GYNECOLOGY. Demonstrations of gynecological and post-operative treatment. Limited to six senior students. One clinic each week. ADAIR.
114. CLINIC IN OBSTETRICS AND GYNECOLOGY. Dispensary. Minneapolis General Hospital. Demonstrations and direct observations and examinations of patients, diagnosis and treatment. Two students. SIMONS, LAVAKE, MALAND, SOUBA, WILLCUTT.
115. ADVANCED CLERKSHIP IN OBSTETRICS AND GYNECOLOGY. Sixth year. Arrange. Staff.
116. GYNECOLOGIC CLINIC. Bedside studies in diagnosis and treatment of diseases of women at St. Paul City and County Hospital. HAMMOND, JONES.
201. ADVANCED OBSTETRICS AND GYNECOLOGY. Includes service in the University Hospital, affording opportunity for experience in diagnosis; care and treatment. Special facilities offered for study of problems and cases of unusual interest. Required of first-year fellows. Hours arranged. LITZENBERG and Staff.
202. Similar to Course 201, but in more advanced subjects in their clinical and research aspects. Required of second-year fellows. Hours arranged. LITZENBERG and Staff.
203. Similar to Courses 201 and 202, but of still more advanced character. Required of third-year fellows. Hours arranged. LITZENBERG and Staff.
204. SEMINAR. A weekly conference for fellows and graduate students. Presentation and discussion of original work and reports upon current literature. A reading knowledge of French and German is necessary. Staff.
205. RESEARCH. Clinical and laboratory research upon problems in obstetrics and gynecology. Required of third-year fellows, who must complete a satisfactory thesis during the year. Elective for other properly qualified graduate students. Hours arranged. Staff.

PEDIATRICS

Professor JULIUS PARKER SEDGWICK; Associate Professors JAMES T. CHRISTISON, WALTER R. RAMSEY; Assistant Professors EDGAR J. HUENEKENS, FREDERICK C. RODDA, FREDERIC W. SCHLUTZ, ROOD TAYLOR; Instructors NABOTH O. PEARCE, MAX SEHAM, MILDRED R. ZIEGLER; Assistants EDWARD D. ANDERSON, EDWIN J. BATCHELDER, JOHN D. GEISSINGER, OTTO A. GROEBNER, GEORGE K. HAGAMAN, GLENN R. MATCHAN, CECILE R. MORIARTY, CHARLES A. OLSON, EDWIN F. ROBB, EUGENE F. WARNER; Teaching Fellows W. RAY SHANNON, CHESTER A. STEWART, LUDO VON MEYSENBURG.

Departmental Office, Millard Hall

REQUIRED COURSES

- 100s,u,f. PHYSICAL DIAGNOSIS IN CHILDREN. A study of special diagnostic methods and results, applied to pediatrics. Conducted in sections of class. Fifth year. 11 hours. TAYLOR.
- 101s,u,f. DISEASES OF CHILDREN. Diseases peculiar to, or distinctive of, children, with particular emphasis upon their differences from adult type. Fifth year. 33 hours. SEDGWICK, et al.
- 102f,w. DISEASES OF CHILDREN. A continuation of Course 101. Fifth year. 22 hours. SEDGWICK, et al.
- 103f,w,s,su. CLINIC IN PEDIATRICS. Conducted at the University Hospital and Minneapolis General Hospital; a part of course in required clinics. Sections of class. Fifth year. 11 hours. SEDGWICK, HUENEKENS, RODDA, and Assistants.
- 104f,w,s,su. CLINIC IN CONTAGIOUS DISEASES. Conducted in the Minneapolis General Hospital; a part of course in required clinics. Sections of class. Fifth year. 11 hours. HUENEKENS and Assistants.
- 106f,w,s,su. OUT-PATIENT PEDIATRIC CLINIC. The practical study of the diseases of children in the Out-Patient Service. Sections of intermediate clinical division. 17 hours. SEHAM and Assistants.
- 107f,w,s,su. CLINICAL CLERKSHIP IN PEDIATRICS. The observation and study of patients in University Hospital and Out-Patient Department under supervision of staff; recording case histories; making physical examinations and provisional diagnoses; following details of treatment. Sections of intermediate division. 44 hours. Staff.

ELECTIVE COURSES*

108. STUDENT INTERNSHIP. A course of resident study in an assigned hospital, covering two quarters, sixth year, under direct supervision of

* Electives in pediatrics usually repeated each quarter. See Medical School quarterly programs.

faculty members of hospital staff. Credit for pediatrics, 88 hours. Staff.

111. DISEASES OF THE NEW-BORN. The pathology and treatment of these disorders, with the presentation of illustrative cases. Limited to six students. SEDGWICK, RODDA, et al.
112. CONTAGIOUS DISEASES. The advanced study of contagious diseases, including the practice of intubation and tracheotomy, with training upon the cadaver. HUENEKENS.
113. PEDIATRIC CLINIC. Out-Patient Department. Limited to six students. SEHAM.
114. COURSE IN INFANT FEEDING. Conducted at the St. Paul Baby Welfare Clinic of the H. Amherst Wilder Charity. RAMSEY.
115. THEORY AND PRACTICE OF INFANT FEEDING. Including a study of diseases of the gastro-intestinal tract. Limited to six students. HUENEKENS.
117. CLINICS IN PEDIATRICS. Conducted in the Out-Patient Service. SEHAM.
119. CLINICS IN PEDIATRICS. Conducted at the University Hospital. RODDA.
120. CLINICS IN PEDIATRICS. Conducted at the Lymanhurst City Hospital. HUENEKENS, TAYLOR.
121. CLINIC IN CONTAGIOUS DISEASES. Conducted at the City and County Hospital, St. Paul. Limited to ten students. RAMSEY, GROEBNER, OLSON, WARNER.
122. COURSE IN THE PATHOLOGY OF THE DISEASES OF CHILDREN. Given in conjunction with the Department of Pathology. Conducted at the University Hospital and at the Department of Pathology. (See Path. 114.) SHANNON.

OPHTHALMOLOGY AND OTO-LARYNGOLOGY

Professor WILLIAM R. MURRAY; Associate Professor FRANK E. BURCH; Assistant Professors HOWARD S. CLARK, JOHN S. MACNIE, HORACE NEWHART, FRED J. PRATT; Instructors WALTER E. CAMP, WILLIAM W. LEWIS, WILLIAM E. PATTERSON, KENNETH A. PHELPS, JOHN A. PRATT, G. ELMER STROUT; Assistants OSCAR A. BURTON, JOHN C. BROWN, CARL C. COWIN, ERLING W. HANSEN, ARTHUR L. KUSSKE, EARL A. LOOMIS, JOHN L. SHELLMAN, H. JOURNEAY WELLES; Teaching Fellows ELLERY L. ARMSTRONG, FRANK N. KNAPP, JAMES L. ROGERS.

Departmental Office, Millard Hall

REQUIRED COURSES

- 77su,w. OPTHALMOLOGY. A course of lectures upon the diseases and disorders of the eye, and their corrective, medical, and surgical treatment. Sixth year. 22 hours. MURRAY.
- 79f,s. OTOTOLOGY. A course of lectures upon the diseases and disorders of the ear; their corrective, medical, and surgical treatment. Sixth year. 11 hours. NEWHART.
- 81f,s. RHINOLOGY AND LARYNGOLOGY. The diagnosis and treatment of diseases of the nose and throat. Sixth year. 17 hours. MURRAY.
- 83f,w,s,su. CLINICS IN EYE, EAR, NOSE, AND THROAT. Diagnostic and operative procedures in the clinics of the University Hospital. Sections, intermediate clinical period. 15 hours. MURRAY, CLARK.
- 85f,w,s,su. CLINIC IN DISEASES OF THE EYE. Study and treatment of cases in the Out-Patient Department; class in sections; a part of course in required clinics, intermediate clinical period. 17 hours. CLARK, MACNIE, and Assistants.
- 87f,w,s,su. CLINIC IN DISEASES OF THE EAR. Study and treatment of cases in the Out-Patient Department; class in sections; a part of course in required clinics, intermediate clinical period. 17 hours. NEWHART and Assistants.
- 89f,w,s,su. CLINICS IN DISEASES OF THE NOSE AND THROAT. Study and treatment of cases in the Out-Patient Department at three weekly sessions; class in sections; a part of course in required clinics; intermediate clinical period. 17 hours. PATTERSON, PRATT, and Assistants.

ELECTIVE COURSES

101. STUDENT INTERNSHIP. A resident course in an assigned hospital, covering two quarters, sixth year, under direct supervision of faculty members of the hospital staff. 22 hours credit in ophthalmology and oto-laryngology.
115. CLINIC IN DISEASES OF THE EYE. The examination of patients, diagnosis of disease conditions and supervised treatment. University Dispensary. CLARK, MACNIE, and Assistants.
117. CLINIC IN DISEASES OF THE EAR. Studies in examination of cases, diagnosis, and supervised treatment. University Dispensary. NEWHART and Assistants.
119. CLINIC IN DISEASES OF THE NOSE AND THROAT. The examination of patients, diagnosis of disease conditions and supervised treatment. University Dispensary. PATTERSON, PRATT, and Assistants.
121. OPERATIVE CLINICS IN EYE, EAR, NOSE, AND THROAT. University Hospital. Limited to ten students. MURRAY, BURCH, CLARK.
123. REFRACTION. A course of lectures. Required of all desiring the practical Course 125. BURCH.

125. PRACTICAL COURSE IN REFRACTION. Limited to ten students. Pre-requisite: Course 123. BURCH, LOOMIS.
126. OPHTHALMOSCOPY. The principles and practice of this method of examination of the eye. CLARK, MACNIE.
127. CLINIC IN DISEASES OF THE EYE. City and County Hospital, St. Paul. Limited to ten students. LEWIS.

THE DEPARTMENT OF SOCIAL SERVICE

Director, MARION A. TEBBETS

ELECTIVE COURSE

101. MEDICAL SOCIAL SERVICE. The interrelation of social and medical work, emphasizing the problems which the physician will most commonly meet in the community. Lectures and field work. Limited to ten students. TEBBETS.

THE SCHOOL OF CHEMISTRY

Associate Professor FRANK H. MACDOUGALL; Assistant Professor LAWRENCE M. HENDERSON.

(Contributing required course to The Medical School)

- 40f. PHYSICAL CHEMISTRY. Special attention will be given to those divisions of the subject which have most application in the science of medicine, such as osmosis, colloidal solutions, chemical equilibria, etc. Third-year medical students. 99 hours; four credits. HENDERSON.

NOTE: For information regarding other available courses in chemistry, see bulletin, School of Chemistry.

DEPARTMENT OF ANIMAL BIOLOGY

Professors HENRY F. NACHTRIEB, HAL DOWNEY, WILLIAM A. RILEY, CHARLES P. SIGERFOOS; Associate Professor ELMER J. LUND.

(Contributing elective courses to the Medical School)

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